Report 11491
June 1999

AEROJET

Integrated Advanced Microwave Sounding Unit-A (AMSU-A)

Performance Verification Report

METSAT (S/N 109) AMSU-A1 Receiver Assemblies

P/N 1356429-1 S/N F06 and P/N 1356409-1 S/N F06

Contract No. NAS 5-32314
CDRL 208

Submitted to:

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Submitted by:

Aerojet
1100 West Hollyvale Street
Azusa, California 91702

Aerojet

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PERFORMANCE VERIFICATION TEST REPORT METSAT (S/N: 109) AMSU-A1 RECEIVER ASSEMBLIES FOR INTEGRATED ADVANCED MICROWAVE SOUNDING UNIT-A (AMSU-A)

CONTRACT NO. NAS5-32314
CDRL PAR 3.3.2.1

JUNE 1999

SUBMITTED TO

NATIONAL AERONAUTICS AND SPACE ADMINISTERATION
GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND 20771

SUBMITTED BY

AEROJET ELECTRONIC SYSTEMS PLANT
1100 WST HOLLYVALE STREET
AZUSA, CALIFORNIA 91702

Report No. 11491
June 1999

AMSU-A RECEIVER VERIFICATION TEST REPORT

LEVEL OF ASSEMBLY:	SUBASSEMBLY
TEST ITEM:	AMSU-A1 RECEIVER ASSEMBLY P/N: 1356429-1, S/N: F06 P/N: 1356409-1, S/N: F06
TYPE OF HARDWARE:	METSAT FLIGHT MODEL (FM)
TYPE OF TEST:	FUNCTIONAL PERFORMANCE
VERIFICATION TEST PROCEDURE:	AE-26002/6A
TEST FACILITY LOCATION:	AESP AZUSA, CALIFORNIA

SIGNATURE:

TEST ENGINEER: ____________ DATE: 6/11/1999

TABLE OF CONTENTS

1.0 INTRODUCTION

The AMSU-A receiver subsystem comprises two separated receiver assemblies; AMSU-A1 and AMSU-A2 (P/N 1356441-1). The AMSU-A1 receiver contains 13 channels and the AMSU-A2 receiver 2 channels. The AMSU-A1 receiver assembly is further divided into two parts; AMSU-A1-1 (P/N 1356429-1) and AMSU-A1-2 (P/N 1356409-1), which contain 9 and 4 channels, respectively. Figures 1 and 2 illustrate the functional block diagrams of the AMSU-A1 and AMSU-A2 receivers.

The AMSU-A receiver subsystem is located in between the antenna and signal processing subsystems of the AMSU-A instrument and comprises the RF and IF components from isolators to attenuators as shown in Figures 1 and 2. It receives the RF signals from the antenna subsystem, down-converts the RF signals to IF signals, amplifies and defines the IF signals to proper power level and frequency bandwidth as specified for each channel, and inputs the IF signals to the signal processing subsystem.

The test reports for the METSAT AMSU-A receiver subsystem are prepared separately for A1 and A2 receivers so that each receiver stands alone during integration of instruments into the spacecraft. This test report presents the test data of the METSAT AMSU-A1 Flight Model No. 6 (FM-6) receiver subsystem. The functional performance tests are conducted either at the component or subsystem level. While the component-level tests are performed over the entire operating temperature range predicted by thermal analysis, most subsystem-level tests are conducted at ambient temperature. The receiver performances were then verified over the operating temperature range by measuring a couple of key receiver performance parameters (bandpass characteristics and noise figure) at extended temperature extremes (-20°C and +50°C) as well as room ambient temperature during two cycles of thermal cycling test. The receiver tests are performed per the Acceptance Test Procedure (ATP) for the AMSU-A Receiver Subsystem, AE-26002/6A.

2.0 REASON FOR TEST

The ATP for the AMSU-A Receiver Subsystem, AE-26002/6A, is prepared to describe in detail the configuration of the test setups and the procedures of tests to verify that the receiver subsystem meets the specifications as required either in the AMSU-A Instrument Performance and Operation Specification, S-480-80, supplied by the customer or in AMSU-A Receiver Subsystem Specification, AE-26608, derived by the Aerojet System Engineering. Test results that verify the conformance to the specifications demonstrate the acceptability of that particular receiver subsystem.

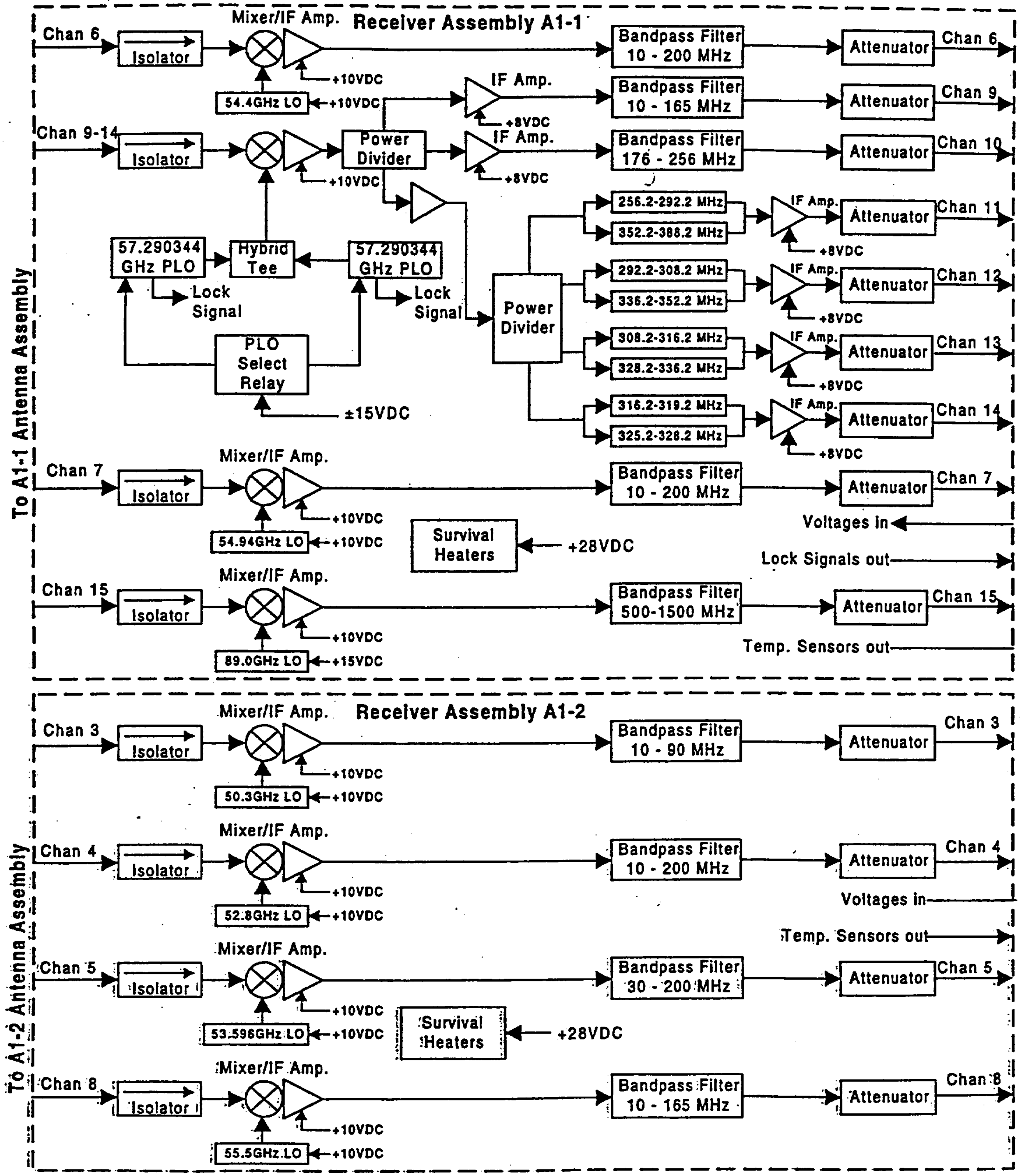

Figure 1. AMSU-A1 Receiver Functional Block Diagram

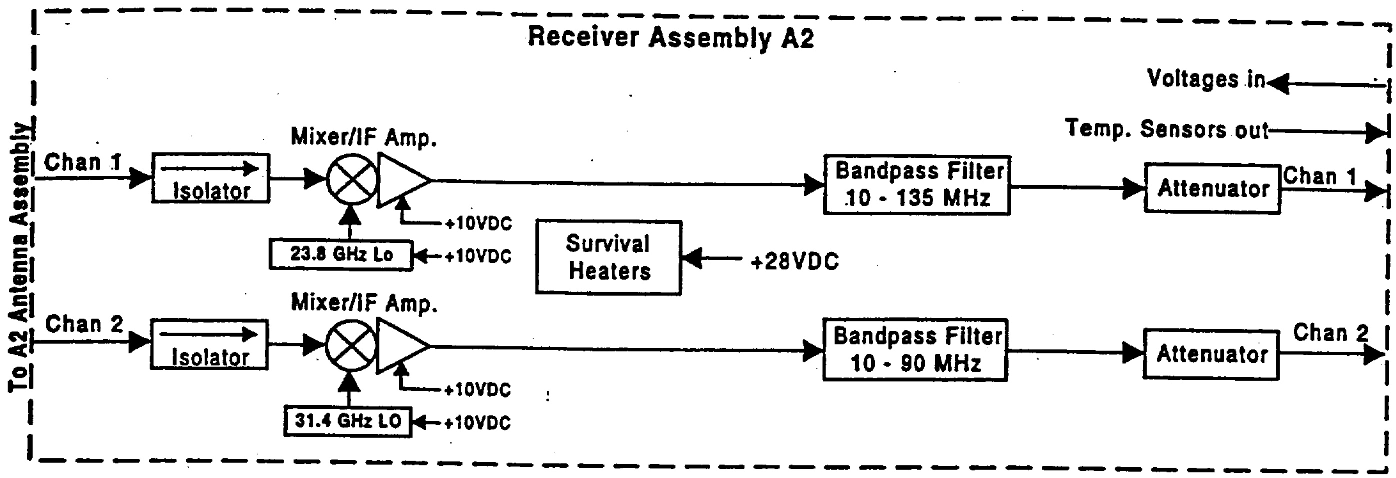

Figure 2. AMSU-A2 Receiver Functional Block Diagram

3.0 ACCEPTANCE TEST

The acceptance tests for the AMSU-A receiver subsystem are performed either at the component or subsystem level. The component-level tests are conducted per the ATP of each component at supplier's facilities. The subsystem-level tests are conducted per the ATP, AE-26002/6A at Aerojet Azusa facility.

The component-level tests include the center frequency, center frequency stability, bandpass characteristics, gain stability, and gain compression. Although the bandpass characteristics can change slightly in subsystem level, these performances are mainly dependent on the component characteristics. The subsystem-level tests include the center frequency, IF output power, bandpass characteristics, noise figure, noise power stability, and the tunable short test.

The subsystem-level tests are performed on AMSU-A1 receivers: AMSU-A1-1 and AMSU-A1-2. However, since the multiplexers of the AMSU-A1 system are integrated to the receivers, the acceptance tests are conducted with the feedhorns directly connected to respective multiplexers that precede the receiver subsystem.

Wire connections between the D-sub connectors and platinum resistance temperature (PRT) sensors and thermistors, D-sub connector and PLO lock detection terminals, and D-sub connector and survival heaters through the thermal switches are verified by measuring either the resistances between the respective two pins or the voltages across the respective two pins. The component bias voltages are verified by measuring the voltages across the two respective banana jacks of the breakout box that are connected to corresponding pins of the D-sub connector.

The receiver tests actually consist of three different tests: engineering evaluation tests, thermal cycling tests and acceptance tests. The engineering evaluation tests were conducted on temporarily mounted receivers prior to the acceptance tests. The tests included the bandpass characteristics, noise figure and noise power stability. The receivers were then subjected to two cycles of thermal cycling test between -20°C and +50°C. During thermal cycling, the bandpass characteristics and noise figures of the channels were measured at two temperature extremes of -20°C and +50°C as well as at room ambient temperature. Operation of the thermal switches was also verified during the thermal cycling test. The acceptance tests were performed per the ATP, AE-26002/6A, at room ambient temperature. Only the acceptance test results are included in this test report.

During the engineering evaluation tests of the AMSU-A1-2 receiver, higher noise power stabilities than the specified were measured for channels 3, 5, and 8. The measured noise power stabilities were ~0.2K against the specifications of 0.12K for channel 3 and ~0.1K and ~0.2K against the specifications of 0.08K for channels 5 and 8.

The bandpass characteristics of the channel 8 also showed badly distorted configuration with a peak (~5dB) at lower end the passband.

The noise power stability of the channel 3 could not be improved to an acceptable level by replacing the receiver components and/or optimizing the LO power level of the DRO. The problem was finally resolved by inserting a tuning shim between the isolator and mixer in addition to replacing the original isolator (P/N: 1356680-1, S/N: 12), mixer/IF amplifier (P/N: 1331562-13, S/N: 7A63) and DRO (P/N: 1356610-3, S/N: 85095) by another units (S/N: 06, S/N: 7A23 and 85097) and lowering the LO power level to +6dBm. The receiver performances were verified over the LO power range of +6dBm +/-1.5dB. The high noise power stability of the channel 5 was improved to an acceptable level by replacing the isolator (P/N: 1356680-6, S/N: 10) and DRO (P/N: 1356610-5, S/N: 85033) by another pair (S/N: 11 and S/N: 85035). The problem of the channel 8 was resolved by replacing the isolator (P/N: 1356680-3, S/N: 09) and mixer/IF amplifier (P/N: 1331562-18, S/N: 7A58) by another (S/N: 11 and S/N: 85095) and adjusting the LO power level at +8.4dBm. Then, the receiver successfully passed both the thermal cycling and acceptance tests.

During the acceptance tests for the A1-1 receiver, high noise power stability of 0.245K was measured against the specification of 0.15K at the LO power level of 7.0dBm. The noise power stability was lowered to an acceptable level by replacing the mixer/ IF amplifier (P/N: 1331562-20, S/N: 7A70) and GDO (P/N: 1336610-10, S/N: FM3) by another set (S/N: 7A60 and S/N: FM2). The bandpass characteristics of the channel 11 showed larger gain difference between the average gains of two passbands comparing to those of previous units. Other than that, no problem/anomaly was encountered in ensuing thermal cycling and acceptance tests for the A1-1 receiver.

4.0 ORGANIZATION OF TEST DATA

The test data are organized in the following formats. The test data obtained at the component level are first summarized for each category for all applicable receiver channels. The bandpass characteristics of the filters are summarized only for the data measured at mid-temperature. Supporting component test data over the operating temperature range then follow the summaries. The test data for the channel 7 DRO (P/N: 1336610-7, S/N: 85017) were those for the reworked unit.

The subsystem-level test data are organized for each receiver (A1-1 and A1-2), but not necessarily in sequential order of tests performed. The test data recorded in the test sheet as prepared in the ATP and related data plots are included in this test report. For the Test Data Sheet 1, different DC power requirements should be applied as two different PLOs are mounted on the AMSU-A1-1 receiver.

5.0 SUMMARY AND RECOMMENDATIONS

The METSAT AMSU-A1 FM-6 receiver subsystem successfully passed all performance requirements and is delivered to System Engineering for system integration and test. The test data, in most cases, indicated adequate margins for key performance specifications.

During engineering evaluation tests of the AMSU-A1 receiver, higher noise power stabilities were measured for four different receiver channels. The corresponding mixer/IF amplifiers, however, showed acceptable noise power stabilities at component-level tests. These problems were similar to those experienced in previous receiver tests. Most of the problems were resolved by adjusting the LO power level and/or replacing the receiver components (isolator, mixer/IF amplifier and DRO or GDO). In rare occasions like the channel 3 of this A1-1 receiver, a tuning shim was required between the isolator and mixer to improve the receiver performances to acceptable levels.

The engineering evaluation and thermal cycling tests incorporated prior to the acceptance tests indeed helped the receiver subsystem tests. If these problems encountered in the engineering evaluation tests were occurred during acceptance tests, it would have taken much longer time to correct them as we have to go through the lengthy processes involved with disassembling and reassembling the completely assembled receiver hardware and associated document preparations.

6.0 TEST DATA

In the following, the component and subsystem-level test data are organized as delineated in Paragraph 4.0.

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CENTER FREQUENCY AND FREQUENCY STABILITY

FOR

LOCAL OSCILLATORS (LOs)
(DROs, PLOs, & GDO)

FREQUENCY STABILITY OF LOs

Channel No.	3	4	5	6	7	8	9-14 *	15
Short-Term Specification (+/-MHz)	8	3	3	3	3	8	0.086	80
Setting Accuracy (+/-MHz)	2	1	1	1	1	2		30
W/ Temp. & Voltage (+/-MHz)	6	2	2	2	2	6		50
Measured (MHz) Total	+3.46, -3.14	+0.21, -0.84	+1.37, -1.66	+1.47, -1..85	**+.25 -0.018**	**+0.33, -0.48**	+0.007, -0.018 +0.016, -0.026	+15., -11.
Long-Term Specification (+/-MHz)	2	2	2	2	2	2	0.114	50
By Design or Analysis ** (+/-MHz)	0.1	0.1	0.1	0.1	0.1	0.1	0.115	76

* Measured for PLO No. 1 and No. 2.

** Based on accelerated life-test data for DROs.

Note: Additional +/-0.1MHz frequency stability reserved for safety margin for channels 11-14.

CENTER FREQUENCY OF LOs

Channel No.	3	4	5	6	7	8	9-14 *	15
Specification (GHz) Setting Accuracy (+/-GHz)	50.3 0.002	52.8 0.001	53.596 0.001	54.4 0.001	54.94 0.001	55.5 0.002	57.290344 0.000086	89.0 0.03
Measured (GHz)	50.30054	52.80020	53.59646	54.40007	**54.94028**	**55.50030**	57.290342 57.290328	89.008

* Measured for PLO No. 1 and No. 2.

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COMPONENT-LEVEL TEST DATA

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Channel 3 LO

DRO (P/N: 1336610-3, S/N: 85097)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85097 QUAL TEST N/A

AESD 1336610- 3
ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	187 mA	Table IIIB
Input Power, P_{diss}	1.87 W DC	P_{diss} max
Frequency, f_{Tnom}	50.30054 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.5 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.54 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	185 mA	Table IIIB
Frequency, f_{meas}	50.30054 GHz	Table IIIB
RF Output Power, P_{meas}	12.5 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	186 mA	Table IIIB
Frequency, f_{meas}	50.30055 GHz	Table IIIB
RF Output Power, P_{meas}	12.5 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 VDC = ∅ MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0.01 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB

Accept ✓ Reject ______

Test Performed by ______ Date 7-18-98
Litton QA LITTON M64 Date 7-20-98

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AM
SERIAL NUMBER: A5097
QUAL TEST N/A
AESD 1336610- 3
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10	°C	10° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	187	mA	Table IIIB
Input Power, P_{diss}	1.87	W DC	Pdiss max
Frequency, $f_{10°C}$	50.29917	GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.5	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	185	mA	Table IIIB
Frequency, f_{meas}	50.29912	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	186	mA	Table IIIB
Frequency, f_{meas}	50.29910	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = −0.05 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = −0.17 MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$) = -1.37 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$) = ∅ dB

Accept ✓ Reject

Test Performed by VN Date 7-18-98
Litton Q.A. LITTON M 64 Date 7-20-98

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM AESD 1336610- 3
SERIAL NUMBER: 85097 QUAL TEST N/A ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	186	mA	Table IIIB
Input Power, P_{diss}	1.86	W DC	Pdiss max
Frequency, f_{Tmin}	50.29770	GHz	Table IIIB
RF Output Power, P_{Tmin}	12.5	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	184	mA	Table IIIB
Frequency, f_{meas}	50.29768	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	185	mA	Table IIIB
Frequency, f_{meas}	50.29763	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at 9.5 VDC = -0.02 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = -0.07 MHz
Δf_T at 10.0 VDC ($=f_{Tmin} - f_{Tnom}$) -2.84 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{Tmin} - P_{Tnom}$) = ∅ dB

Accept ✓ Reject ____

Test Performed by V Date 7-18-98
Litton Q.A. LITTON M64 Date 7-20-98

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AM
SERIAL NUMBER: 85097 QUAL TEST N/A

AESD 1336610- 3
ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30	°C	30° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	188	mA	Table IIIB
Input Power, P_{diss}	1.88	W DC	Pdiss max
Frequency, $f_{30°C}$	50.30147	GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.5	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	30	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	186	mA	Table IIIB
Frequency, f_{meas}	50.30149	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	30	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	187	mA	Table IIIB
Frequency, f_{meas}	50.30151	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = 0.02 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0.04 MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$) = 0.93 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$) = ∅ dB

Accept ✓ Reject ______

Test Performed by VN Date 7-18-98
Litton Q.A. LITTON M64 Date 7-20-98

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85097
QUAL TEST N/A
AESD 1336610- 3
ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	189	mA	Table IIIB
Input Power, P_{diss}	1.89	W DC	Pdiss max
Frequency, f_{Tmax}	50.30314	GHz	Table IIIB
RF Output Power, P_{Tmax}	12.4	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	186	mA	Table IIIB
equency, f_{meas}	50.30318	GHz	Table IIIB
F Output Power, P_{meas}	12.4	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	188	mA	Table IIIB
Frequency, f_{meas}	50.30320	GHz	Table IIIB
RF Output Power, P_{meas}	12.4	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:
Δf_V at 9.5 VDC or at 9.5 VDC = 0.04 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0.06 MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$) = 2.6 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$) = -0.1 dB

Accept ✓ Reject

Test Performed by VN Date 7-18-98
tton Q.A. Date 7-20-98

LITTON MCG

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.7
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AM AESD 1336610- 3
SERIAL NUMBER: 85097 QUAL TEST N/A ACCEPT TEST ✓

Power Supply Immunity, Ref. Test Para. 5.2.4

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Initial Measurement			
Temperature	22	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	187	mA	Table IIIB
Input Power	1.87	W DC	Pdiss max
Frequency (f_{Tnom})	50.30052	GHz	Table IIIB
RF Output Power	12.5	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.52	MHz	

Performance After Short Circuit on Power Supply: Ref Test Para 5.2.4.2

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	188	mA	Table IIIB
Input Power	1.88	W DC	Pdiss max
Frequency	50.30054	GHz	Table IIIB
RF Output Power	12.5	dBm	12 to 17 dBm

Over Voltage: Ref Test Para 5.2.4.3

Overvoltage Input Voltage	28	VDC	+28V

Performance After Input Overvoltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	188	mA	Table IIIB
Input Power	1.88	W DC	Pdiss max
Frequency	50.30049	GHz	Table IIIB
RF Output Power	12.5	dBm	12 to 17 dBm

Reverse Polarity: Ref Test Para 5.2.4.4

Reverse Input Voltage	-10	VDC	-10.0 ± 0.2 VDC

Performance After Reverse Input Voltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	188	mA	Table IIIB
Input Power	1.88	W DC	Pdiss max
Frequency, f_{Tnom}	50.30049	GHz	Table IIIB
RF Output Power	12.5	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.49	MHz	

Test Performed by VN
Litton Q.A. LITTON M64

Accept ✓ Reject
Date 7-18-98
Date 7-20-98

LITTON
Solid State

TEST DATA SHEET 7.22A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85097
QUAL TEST N/A
AESD 1336610- 3
ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION | LIMITS

1. Initial Performance at Tnom ± 1°C

Temperature	22	°C	Tnom ± 1°C
Frequency, f_{Tnom}	50.30054	GHz	Table IIIB
RF Output Power, P_{Tnom}	12.5	dBm	12 to 17 dBm
Input Voltage, V_B	10	VDC	10 ± 0.2 VDC
Input Current, I_B	187	mA	Table IIIB
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.54	MHz	

2. Performance at Tnom ± 1°C after +60°C soak.

Tempera..re	22	°C	Tnom ± 1°C
Frequenc.. f_{meas}	50.30079	GHz	Table IIIB
.F Outp.. ..ower, P_{meas}	12.5	dBm	12 to 17 dBm
Input Vo.. .e	10	VDC	V_B ± .005 VDC
Input Cur..	188	mA	Table IIIB

3. Performance at Tnom ± 1°C after -30°C soak.

Temperat..	22	°C	Tnom ± 1°C
Frequenc.. ..eas	50.30032	GHz	Table IIIB
RF Outp.. ..wer, P_{meas}	12.5	dBm	12 to 17 dBm
Input Vo..	10	VDC	V_B ± .005 VDC
Input Cu..	187	mA	Table IIIB

Calculate ..uency variation, $\Delta f_H = f_{meas} - f_{Tnom}$:
Δf_H after .. soak = 0.25 MHz
Δf_H after .. soak = -0.22 MHz

..alculate ..utput power variation, $\Delta P_H = P_{meas} - P_{Tnom}$:
..P_H = af.. ..°C soak = ∅ dB
..P_H = af.. ..°C soak = ∅ dB

Accept ✓ Reject ____

..est Perf.. ..d by VN Date 7-18-98
..tton Q.. Date 7-20-98

LITTON M&P

..DE ID..	..NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
	..48	A	1300823	B3	

..TON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

LITTON
Solid State

TEST DATA SHEET 7.23A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85097 QUAL TEST N/A
AESD 1336610- 3
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Initial Measurement. Ref Test Par. 5.9.1		
Temperature	22 °C	24°C ± 5°C
Frequency	50.30061 GHz	Table IIIB
RF Output Power	12.6 dBm	12 to 17 dBm
Input Voltage	10 VDC	10 ± 0.2 VDC
Input Current	188 mA	Table IIIB
Reference test. Ref. Test Para. 5.9.3		
Frequency, f_{Ref}	50.30088 GHz	Table IIIB
RF Output Power, P_{Ref}	-4.6 dBm	
Load Pulling Test. Ref. Test Para. 5.9.4		
Maximum Frequency, f_{meas}	50.30089 GHz	Table IIIB
Minimum Frequency, f_{meas}	50.30087 GHz	Table IIIB
Maximum RF Output Power P_{meas}	-4.3 dBm	
Minimum RF Output Power, P_{meas}	-4.6 dBm	

Calculate maximum positive (f_{meas} is greater than f_{Ref}) and negative (f_{meas} is less than f_{Ref}) frequency variation, $\Delta f_L = f_{meas} - f_{Ref}$:

Maximum Positive Δf_L = 0.01 MHz
Maximum Negative Δf_L = – 0.01 MHz

Calculate maximum positive (P_{meas} is greater than P_{Ref}) and negative (P_{meas} is less than P_{Ref}) RF Output Power Variation, $\Delta P_L = P_{meas} - P_{Ref}$:

Maximum Positive ΔP_L = 0.3 dB
Maximum Negative ΔP_L = – 0.3 dB

Accept ✓ Reject ______

Test Performed by VN Date 7-20-98
Litton Q.A. LITTON MC4 Date 7-20-98

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 60 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AM
SERIAL NUMBER: 85097 QUAL TEST N/A

AESD 1336610- 3
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	22	°C	24°C ± 5°C
Frequency:	50.30080	GHz	Table IIIB
RF Output Power:	12.6	dBm	12 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current:	188	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	0.90	MHz (Positive)	Table IIIB
	−0.23	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	2.66	MHz (Positive)	Table IIIB
	−3.01	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0.3	dB (Positive)	1.0 dB
	−0.4	dB (Negative)	-1.0 dB

Accept ✓ Reject ______

Test Performed by VN Date 7-20-98

itton Q.A. LITTON M64 Date 7-20-98

Report No. 11491
June 1999

Channel 4 LO

DRO (P/N: 1336610-4, S/N: 85042)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AF/A
SERIAL NUMBER: 85042
QUAL TEST N/A
AESD 1336610-4
ACCEPT TEST ✓

Basic Electrical Test: Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	206 mA	Table IIIB
Input Power, P_{diss}	2.06 W DC	P_{diss} max
Frequency, f_{Tnom}	52.80020 GHz	Table IIIB
RF Output Power, P_{Tnom}	14.1 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.20 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	204 mA	Table IIIB
Frequency, f_{meas}	52.80020 GHz	Table IIIB
RF Output Power, P_{meas}	14.1 dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	204 mA	Table IIIB
Frequency, f_{meas}	52.80020 GHz	Table IIIB
RF Output Power, P_{meas}	14.1 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 VDC = 0 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB

Accept ✓ Reject ______

Test Performed by DM Date 5-18-98
Litton QA Date JUN 1 2 1998

LITTON QA 160

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AF/A AESD 1336610- 4
SERIAL NUMBER: 85042 QUAL TEST N/A ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10	°C	10° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	203	mA	Table IIIB
Input Power, P_{diss}	2.03	W DC	Pdiss max
Frequency, $f_{10°C}$	52.79998	GHz	Table IIIB
RF Output Power, $P_{10°C}$	14.2	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1
Measurement at 9.5 VDC or at 9.5 VDC

Temperature	10	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	202	mA	Table IIIB
Frequency, f_{meas}	52.79998	GHz	Table IIIB
RF Output Power, P_{meas}	14.2	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC

Temperature	10	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	202	mA	Table IIIB
Frequency, f_{meas}	52.79998	GHz	Table IIIB
RF Output Power, P_{meas}	14.2	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:
Δf_V at 9.5 VDC or at 9.5 VDC = 0 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0 MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$) = -0.22 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$) = 0.1 dB

Accept ✓ Reject ______

Test Performed by DH Date 5-18-98
Litton Q.A. LITTON M 80 Date JUN 12 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B3	

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AF/A AESD 1336610- 4
SERIAL NUMBER: 85042 QUAL TEST N/A ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	0 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	203 mA	Table IIIB
Input Power. P_{diss}	2.03 W DC	Pdiss max
Frequency, f_{Tmin}	52.79983 GHz	Table IIIB
RF Output Power. P_{Tmin}	14.3 dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2
Measurement at 9.5 VDC or at 9.5 VDC

Temperature	0 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para 5.2.3.2
Input Current	201 mA	Table IIIB
Frequency, f_{meas}	52.79983 GHz	Table IIIB
RF Output Power. P_{meas}	14.3 dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC

Temperature	0 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para 5.2.3.3
Input Current	202 mA	Table IIIB
Frequency, f_{meas}	52.79983 GHz	Table IIIB
RF Output Power. P_{meas}	14.3 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:
Δf_V at 9.5 VDC or at 9.5 VDC = 0 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0 MHz
Δf_T at 10.0 VDC ($=f_{Tmin} - f_{Tnom}$) -0.37 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB
ΔP_T at 10.0 VDC ($=P_{Tmin} - P_{Tnom}$) = 02 dB

Accept ✓ Reject ____

Test Performed by DM Date 5-18-98
Litton Q.A. [stamp: LITTON 60] Date JUN 1 2 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 40 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AF/A AESD 1336610- 4
SERIAL NUMBER: 85042 QUAL TEST N/A ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	30 °C	30° ± 1°C
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	205 mA	Table IIIB
Input Power, P_{diss}	2.05 W DC	Pdiss max
Frequency, $f_{30°C}$	52.80011 GHz	Table IIIB
RF Output Power, $P_{30°C}$	14.1 dBm	12 to 17 dBm
Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3		
Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	30 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	203 mA	Table IIIB
Frequency, f_{meas}	52.80011 GHz	Table IIIB
RF Output Power, P_{meas}	14.1 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	30 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	203 mA	Table IIIB
Frequency, f_{meas}	52.80011 GHz	Table IIIB
RF Output Power, P_{meas}	14.1 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:
Δf_V at 9.5 VDC or at 9.5 VDC = 0 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0 MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$) = -0.09 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$) = 0 dB

Accept ✓ Reject

Test Performed by DM Date 5-18-98
Litton Q.A. Date JUN 1 2 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AF/A AESD 1336610- 4
SERIAL NUMBER: 85042 QUAL TEST N/A ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	43	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	206	mA	Table IIIB
Input Power, P_{diss}	2.06	W DC	Pdiss max
Frequency, f_{Tmax}	52.80003	GHz	Table IIIB
RF Output Power, P_{Tmax}	13.9	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	43	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	204	mA	Table IIIB
Frequency, f_{meas}	52.800 03	GHz	Table IIIB
RF Output Power, P_{meas}	13.9	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	43	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	204	mA	Table IIIB
Frequency, f_{meas}	52.800 03	GHz	Table IIIB
RF Output Power, P_{meas}	13.9	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at 9.5 VDC = 0 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0 MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$) = -0.17 MHz

Calculate RF Output Power Variation. $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$) = -0.2 dB

Accept ✓ Reject ____

Test Performed by ____ Date 5-18-98
Litton Q.A. 160 LITTON Date JUN 12 1998

LITTON

Solid State

TEST DATA SHEET 7.7
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AF/A AESD 1336610- 4
SERIAL NUMBER: 850142 QUAL TEST N/A ACCEPT TEST ✓

Power Supply Immunity, Ref. Test Para. 5.2.4

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Initial Measurement			
Temperature	22	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	206	mA	Table IIIB
Input Power	2.06	W DC	Pdiss max
Frequency (f_{Tnom})	52.80008	GHz	Table IIIB
RF Output Power	14.1	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.08	MHz	

Performance After Short Circuit on Power Supply: Ref Test Para 5.2.4.2

Input Voltage	22	VDC	10.0 ± 0.2 VDC
Input Current	206	mA	Table IIIB
Input Power	2.06	W DC	Pdiss max
Frequency	52.80009	GHz	Table IIIB
RF Output Power	14.1	dBm	12 to 17 dBm

Over Voltage: Ref Test Para 5.2.4.3

Overvoltage Input Voltage	28	VDC	+28V

Performance After Input Overvoltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	206	mA	Table IIIB
Input Power	2.06	W DC	Pdiss max
Frequency	52.80008	GHz	Table IIIB
RF Output Power	14.1	dBm	12 to 17 dBm

Reverse Polarity: Ref Test Para 5.2.4.4

Reverse Input Voltage	-10	VDC	-10.0 ± 0.2 VDC

Performance After Reverse Input Voltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	206	mA	Table IIIB
Input Power	2.06	W DC	Pdiss max
Frequency, f_{Tnom}	52.80010	GHz	Table IIIB
RF Output Power	14.1	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.10	MHz	

Accept ✓ Reject ______

Test Performed by DH Date 5-18-98

Litton Q.A. 09 LITTON Date JUN 1 9 1998

LITTON
Solid State

TEST DATA SHEET 7.22A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AF/A
SERIAL NUMBER: 85042 QUAL TEST N/A
AESD 1336610-4
ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION		LIMITS
1. Initial Performance at Tnom ± 1°C		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{Tnom}	52.80020 GHz	Table IIIB
RF Output Power, P_{Tnom}	14.1 dBm	12 to 17 dBm
Input Voltage, V_B	10 VDC	10 ± 0.2 VDC
Input Current, I_B	205 mA	Table IIIB
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.20 MHz	
2. Performance at Tnom ± 1°C after +60°C soak.		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{meas}	52.79974 GHz	Table IIIB
RF Output Power, P_{meas}	14.0 dBm	12 to 17 dBm
Input Voltage	10 VDC	V_B ± .005 VDC
Input Current	206 mA	Table IIIB
3. Performance at Tnom ± 1°C after -30°C soak.		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{meas}	52.79978 GHz	Table IIIB
RF Output Power, P_{meas}	14.2 dBm	12 to 17 dBm
Input Voltage	10 VDC	V_B ± .005 VDC
Input Current	205 mA	Table IIIB

Calculate frequency variation, $\Delta f_H = f_{meas} - f_{Tnom}$:
Δf_H after 60°C soak = -0.46 MHz
Δf_H after -30°C soak = - 0.44 MHz

Calculate RF output power variation, $\Delta P_H = P_{meas} - P_{Tnom}$:
ΔP_H = after 60°C soak = -0.2 dB
ΔP_H = after -30°C soak = 0.1 dB

Accept ✓ Reject

Test Performed by DM Date 5-21-98
Litton Q.A. Date JUN 12 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.23A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AE/A AESD 1336610- 4
SERIAL NUMBER: 85042 QUAL TEST N/A ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Initial Measurement. Ref Test Par. 5.9.1			
Temperature	23	°C	24°C ± 5°C
Frequency	52.79984	GHz	Table IIIB
RF Output Power	14.2	dBm	12 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current	205	mA	Table IIIB
Reference test. Ref. Test Para. 5.9.3			
Frequency, f_{Ref}	52.79984	GHz	Table IIIB
RF Output Power, P_{Ref}	-11.4	dBm	
Load Pulling Test. Ref. Test Para. 5.9.4			
Maximum Frequency, f_{meas}	52.79985	GHz	Table IIIB
Minimum Frequency, f_{meas}	52.79983	GHz	Table IIIB
Maximum RF Output Power P_{meas}	-10.9	dBm	
Minimum RF Output Power, P_{meas}	-11.6	dBm	

Calculate maximum positive (f_{meas} is greater than f_{Ref}) and negative (f_{meas} is less than f_{Ref}) frequency variation. $\Delta f_L = f_{meas} - f_{Ref}$:

Maximum Positive Δf_L = 0.01 MHz
Maximum Negative Δf_L = -0.01 MHz

Calculate maximum positive (P_{meas} is greater than P_{Ref}) and negative (P_{meas} is less than P_{Ref}) RF Output Power Variation. $\Delta P_L = P_{meas} - P_{Ref}$:

Maximum Positive ΔP_L = 0.5 dB
Maximum Negative ΔP_L = -0.2 dB

Accept ✓ Reject ________

Test Performed by ________ TM Date 5-21-98
Litton Q.A. ________ LITTON M... Date JUN 12 1998

LITTON
Solid State

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AF/A
SERIAL NUMBER: 85042
QUAL TEST N/A
AESD 1336610- 4
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	23	°C	24°C ± 5°C
Frequency:	52.79980	GHz	Table IIIB
RF Output Power:	14.2 ~~12.9~~	dBm	12 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current:	205	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	0.21	MHz (Positive)	Table IIIB
	0.47	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	0	MHz (Positive)	Table IIIB
	- 0.37	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0.8	dB (Positive)	1.0 dB
	- 0.6	dB (Negative)	-1.0 dB

Accept ✓ Reject ________

Test Performed by DH Date 5-21-98

Litton Q.A. LITTON 69 Date JUN 12 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 61 OF 68
56348	A	1300823	B3	

Channel 5 LO

DRO (P/N: 1336610-5, S/N: 85036)

LITTON
Solid State

TEST DATA SHEET 7.28
MECHANICAL MEASUREMENTS
FINAL DATA SET

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85036
QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Weight Ref. Test Para. 6.1.

SPECIFICATION	MEASUREMENT	LIMIT
Weight:	1 lb 4.2oz	1.5 pounds max.

Accept ✓ Reject ____

Inspection Performed By: LITTON 1180 Date: JUL 30 1998

Litton Q.A. Date: JUL 30 1998

Outline and Marking

Ref. Test Para. 6.2, Inspection to Outline drawing, Litton 1300316 B1

Accept ✓ Reject ____

Inspection Performed by: Date: JUL 30 1998

Litton Q.A. Date JUL 30 1998

ON
d State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AG/A AESD 1336610- 5
SERIAL NUMBER: 85036 QUAL TEST N/A ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	180 mA	Table IIIB
Input Power, P_{diss}	1.80 W DC	P_{diss} max
Frequency, f_{Tnom}	53.59646 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.2 dBm	11.5 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.46 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	178 mA	Table IIIB
Frequency, f_{meas}	53.59646 GHz	Table IIIB
RF Output Power, P_{meas}	12.2 dBm	11.5 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	179 mA	Table IIIB
Frequency, f_{meas}	53.59646 GHz	Table IIIB
RF Output Power, P_{meas}	12.2 dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 VDC = Ø MHz
Δf_V at 10.5 VDC or at 10.5 VDC = Ø MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 VDC = Ø dB
ΔP_V at 10.5 VDC or at 10.5 VDC = Ø dB

Accept ✓ Reject ______

Test Performed by VN Date 7-29-98
Litton QA Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85036 QUAL TEST N/A

AESD 1336610- 5
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10	°C	10° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180	mA	Table IIIB
Input Power, P_{diss}	1.80	W DC	Pdiss max
Frequency, $f_{10°C}$	53.59703	GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.2	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	177	mA	Table IIIB
Frequency, f_{meas}	53.59703	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	178	mA	Table IIIB
Frequency, f_{meas}	53.59702	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = ∅ MHz
Δf_V at 10.5 VDC or at 10.5 VDC = -0.01 MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$) = 0.57 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$) = ∅ dB

Accept ✓ Reject ______

Test Performed by VN Date 7-29-98
Litton Q.A. Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AG/A
SERIAL NUMBER: 85036 QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	179	mA	Table IIIB
Input Power, P_{diss}	1.79	W DC	Pdiss max
Frequency, f_{Tmin}	53.59783	GHz	Table IIIB
RF Output Power, P_{Tmin}	12.1	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	178	mA	Table IIIB
Frequency, f_{meas}	53.59783	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	11.5 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	178	mA	Table IIIB
Frequency, f_{meas}	53.59783	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at 9.5 VDC =	∅	MHz
Δf_V at 10.5 VDC or at 10.5 VDC =	∅	MHz
Δf_T at 10.0 VDC ($=f_{Tmin} - f_{Tnom}$)	1.37	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at 9.5 VDC =	∅	dB
ΔP_V at 10.5 VDC or at 10.5 VDC =	∅	dB
ΔP_T at 10.0 VDC ($=P_{Tmin} - P_{Tnom}$) =	-0.1	dB

Accept ✓ Reject ____

Test Performed by VN Date 7-29-98
Litton Q.A. LITTON M 63 Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 40 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AG/A
SERIAL NUMBER: 85036
QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30	°C	30° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180	mA	Table IIIB
Input Power, P_{diss}	1.80	W DC	Pdiss max
Frequency, $f_{30°C}$	53.59624	GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.2	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	30	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	178	mA	Table IIIB
Frequency, f_{meas}	53.59624	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	30	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	179	mA	Table IIIB
Frequency, f_{meas}	53.59624	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = ∅ MHz
Δf_V at 10.5 VDC or at 10.5 VDC = ∅ MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$) = – 0.22 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$) = ∅ dB

Accept ✓ Reject ______

Test Performed by VN Date 7-29-98
Litton Q.A. Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85036
QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	181	mA	Table IIIB
Input Power, P_{diss}	1.81	W DC	Pdiss max
Frequency, f_{Tmax}	53.59481	GHz	Table IIIB
RF Output Power, P_{Tmax}	12.1	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	178	mA	Table IIIB
Frequency, f_{meas}	53.59481	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	179	mA	Table IIIB
Frequency, f_{meas}	53.59481	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:
Δf_V at 9.5 VDC or at 9.5 VDC = ∅ MHz
Δf_V at 10.5 VDC or at 10.5 VDC = ∅ MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$) = -1.65 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$) = -0.1 dB

Accept ✓ Reject ____

Test Performed by VN Date 7-29-98
Litton Q.A. LITTON MSD Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.7
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A AESD 1336610- 5
SERIAL NUMBER: 85036 QUAL TEST N/A ACCEPT TEST ✓

Power Supply Immunity, Ref. Test Para. 5.2.4

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Initial Measurement			
Temperature	22	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180	mA	Table IIIB
Input Power	1.80	W DC	Pdiss max
Frequency (f_{Tnom})	53.59658	GHz	Table IIIB
RF Output Power	12.2	dBm	11.5 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	~~0.42~~ VN 0.58	MHz	

Performance After Short Circuit on Power Supply: Ref Test Para 5.2.4.2

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180	mA	Table IIIB
Input Power	1.80	W DC	Pdiss max
Frequency	53.59649	GHz	Table IIIB
RF Output Power	12.2	dBm	11.5 to 17 dBm

Over Voltage: Ref Test Para 5.2.4.3

Overvoltage Input Voltage	28	VDC	+28V

Performance After Input Overvoltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180	mA	Table IIIB
Input Power	1.80	W DC	Pdiss max
Frequency	53.59657	GHz	Table IIIB
RF Output Power	12.2	dBm	11.5 to 17 dBm

Reverse Polarity: Ref Test Para 5.2.4.4

Reverse Input Voltage	-10	VDC	-10.0 ± 0.2 VDC

Performance After Reverse Input Voltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180	mA	Table IIIB
Input Power	1.80	W DC	Pdiss max
Frequency, f_{Tnom}	53.59657	GHz	Table IIIB
RF Output Power	12.2	dBm	11.5 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.43	MHz	

Accept ✓ Reject ______

Test Performed by DM Date 7-29-98
Litton Q.A. LITTON M.60 Date JUL 30 1998

CODE IDENT NO. 56348	SIZE A	NUMBER 1300823	REV C	SHEET 43 OF 68

LITTON
Solid State

TEST DATA SHEET 7.8
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

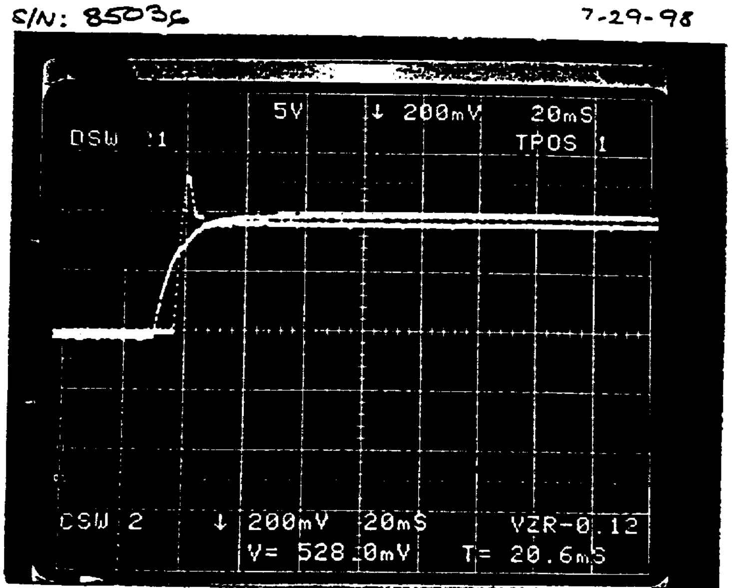
LITTON TYPE LS E 9036 AG/A AESD 1336610- 5
SERIAL NUMBER: 85036 QUAL TEST N/A ACCEPT TEST ✓

Maximum Instantaneous Current, Ref. Test Para. 5.3

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Temperature:	22	°C	Tnom ± 1°C
Input Voltage:	10	VDC	10.0 ± 0.2 VDC
Maximum Instantaneous Current:	264	mA	Table IIIB

Attach photograph

S/N: 85036 7-29-98



Max Instantaneous current is 264 mA

Accept ✓ Reject

Test Performed by [signature] Date 7-29-98

Litton Q.A. LITTON Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 44 OF 68
56348	A	1300823	C	

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

TEST DATA SHEET 7.9
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85036 QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Start up at Survival Temperature Extremes, Ref. Test Para. 5.4

Turn-On Characteristics at -30° ± 1°C
Ref. Test Para. 5.4.3

Temp °C	Vop VDC	Iop mA	Freq. GHz	Pout dBm
-30	10	178	53.59869	11.5

Turn-On Characteristics at +60° ± 1°C
Ref. Test Para. 5.4.5

Temp °C	Vop VDC	Iop mA	Freq. GHz	Pout dBm
60	10	181	53.59313	12.0

Test Performed by DH Date 7-29-98

Litton Q.A. LITTON Date JUL 3 0 1998

LITTON
Solid State

TEST DATA SHEET 7.10
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AG/A
SERIAL NUMBER: 85036 QUAL TEST N/A

AESD 1336610- 5
ACCEPT TEST ✓

Spurious Outputs: Ref. Test Para. 5.5.2

TEST DESCRIPTION		LIMITS
Temperature	22 °C	Tnom ± 1°C
Spurious Outputs Peaks observed:	YES ✓	NO
Value of peaks observed, if any:	<-90	-90 dBc min

Attach Spurious Signals plots from Spectrum Analyzer.

Accept ✓ Reject ______

Test Performed by MH Date 7-29-98

Litton Q.A. LITTON M 60 Date JUL 30 1998

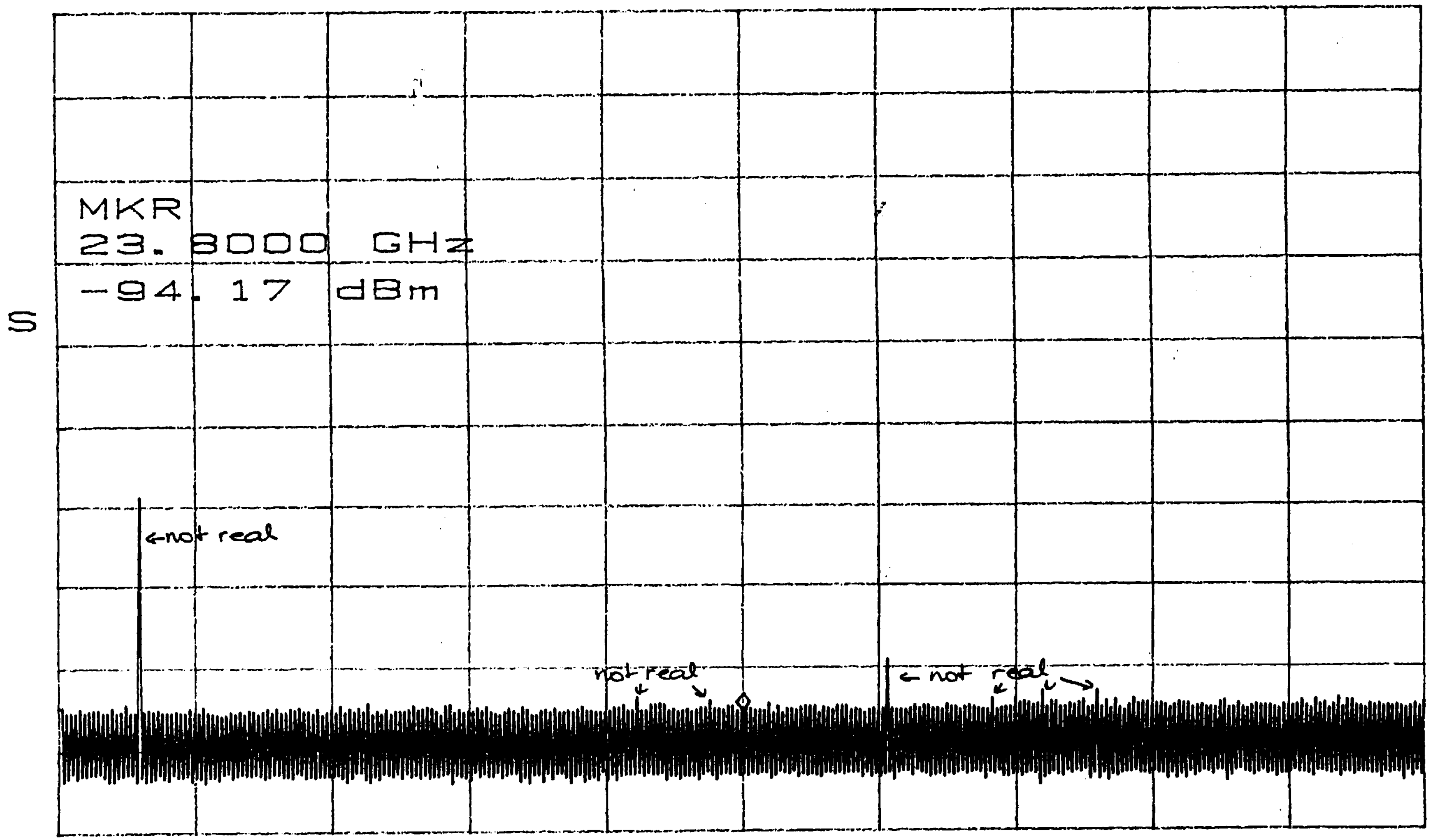
CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 46 OF 68
56348	A	1300823	C	

22ⁿ
S/N :5036
7-29-98
DM

spurious

CL 21.0dB
RL -9.0dBm 10dB/

MKR -94.17dBm
23.8000GHz

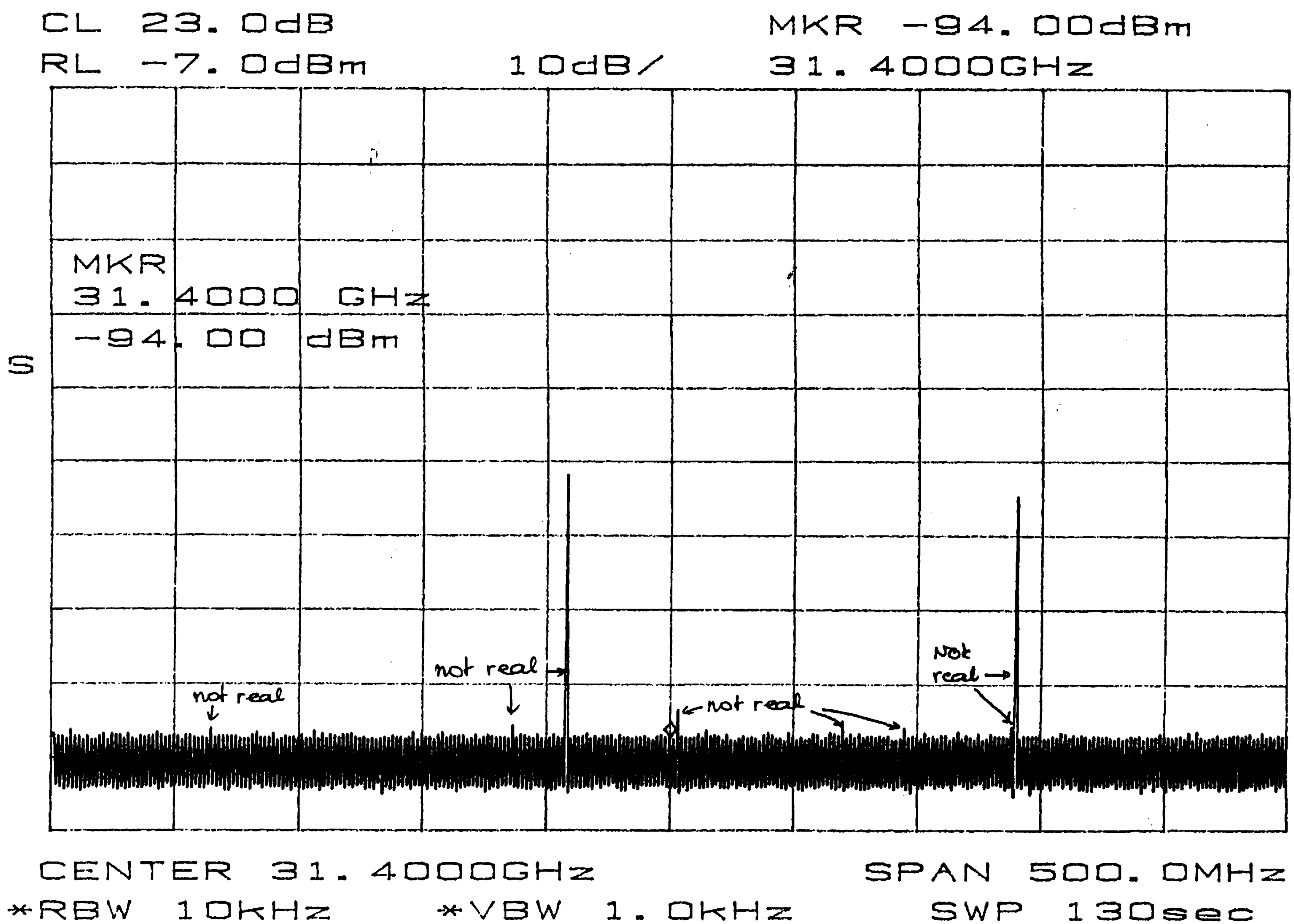


CENTER 23.8000GHz
*RBW 10kHz *VBW 1.0kHz

SPAN 500.0MHz
SWP 130sec

S/N, 8 136
7-29-98
DH

SPURIOUS

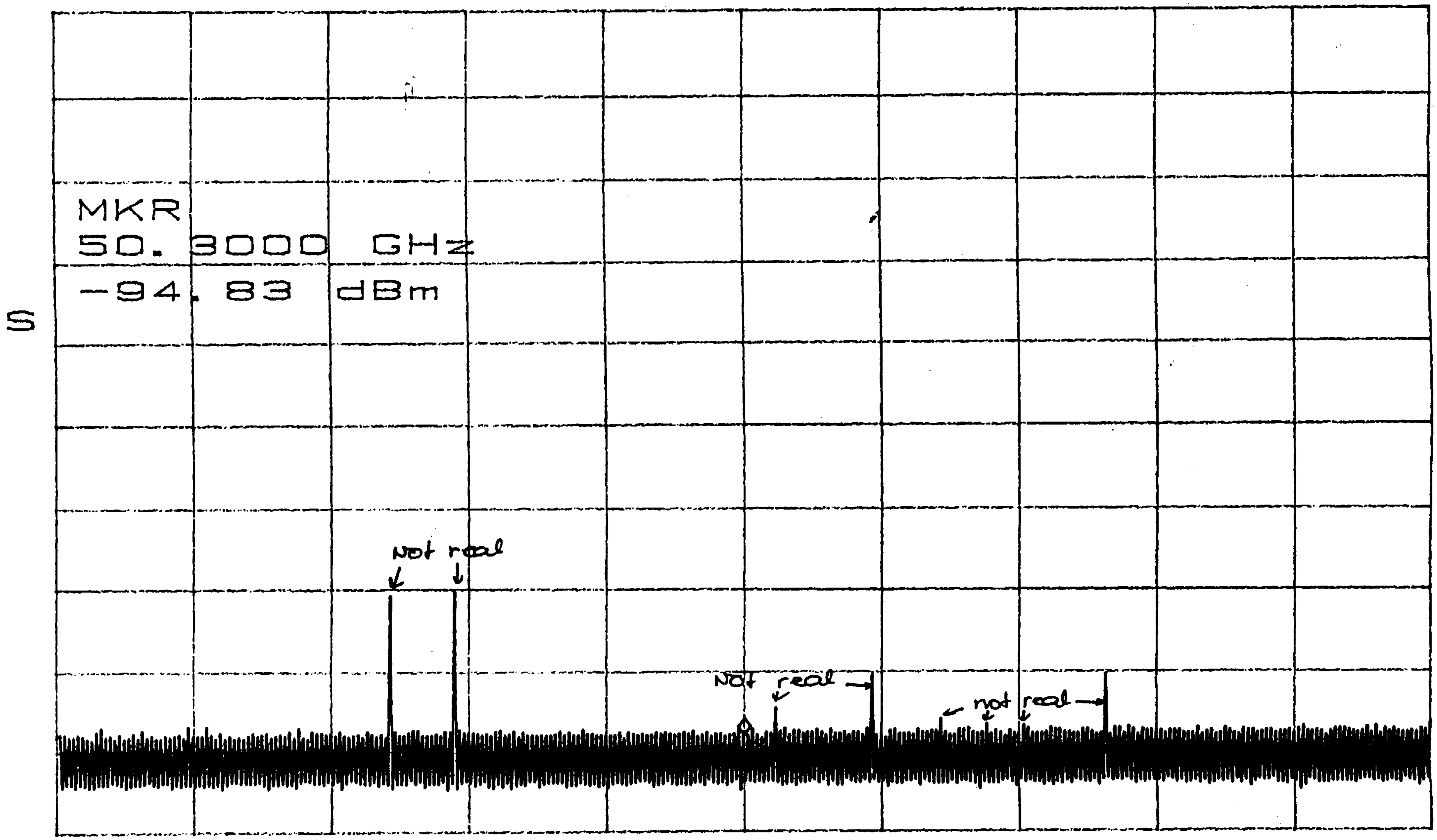


22°
S/N .3036
7-29-98
DM

SPURIOUS

CL 23.0dB
RL -7.0dBm 10dB/

MKR -94.83dBm
50.3000GHz



CENTER 50.3000GHz
*RBW 10kHz *VBW 1.0kHz

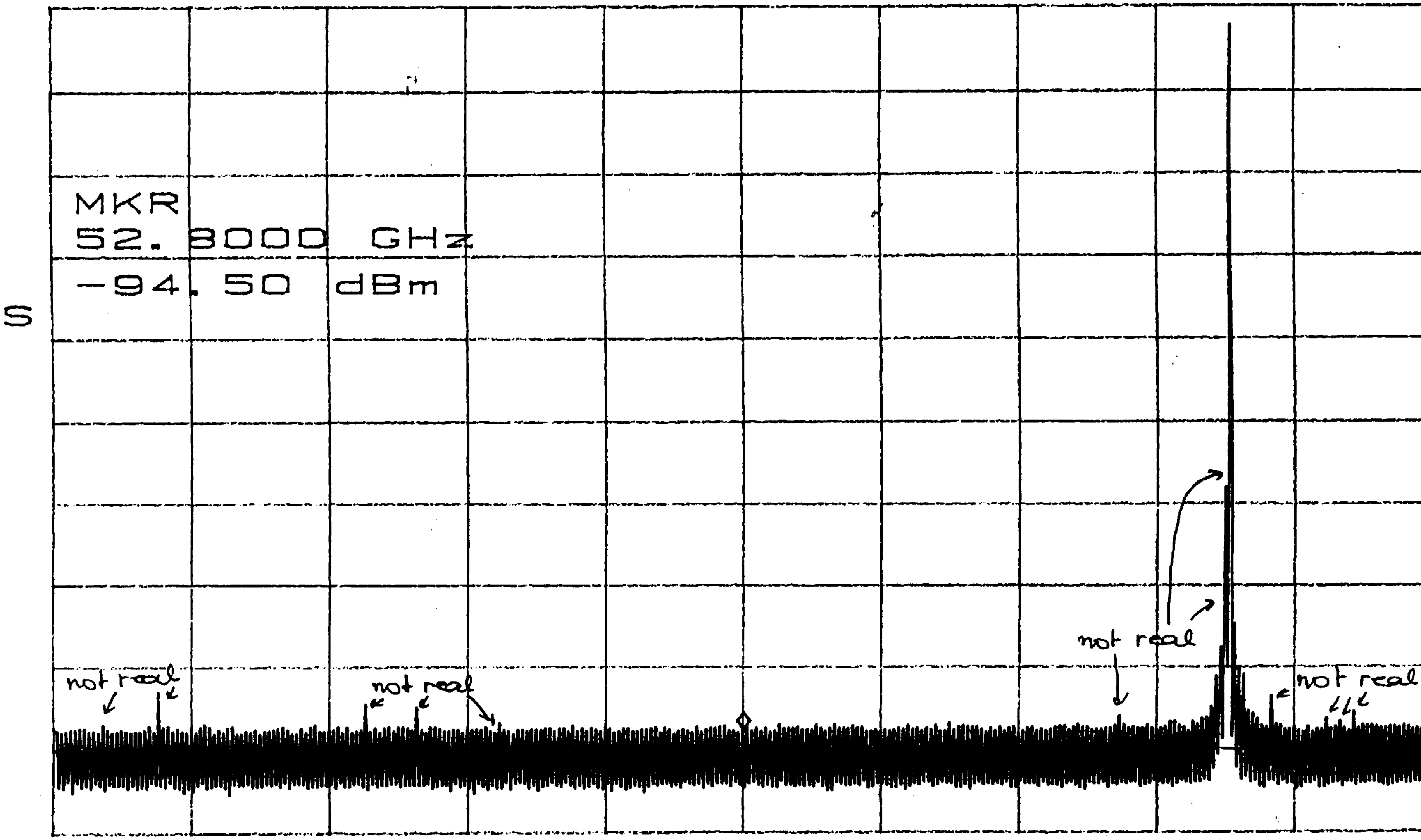
SPAN 500.0MHz
SWP 130sec

23°C
S/N 85036
7-29-98
DM

SPURIOUS

CL 23.0dB
RL -7.0dBm 10dB/

MKR -94.50dBm
52.8000GHz

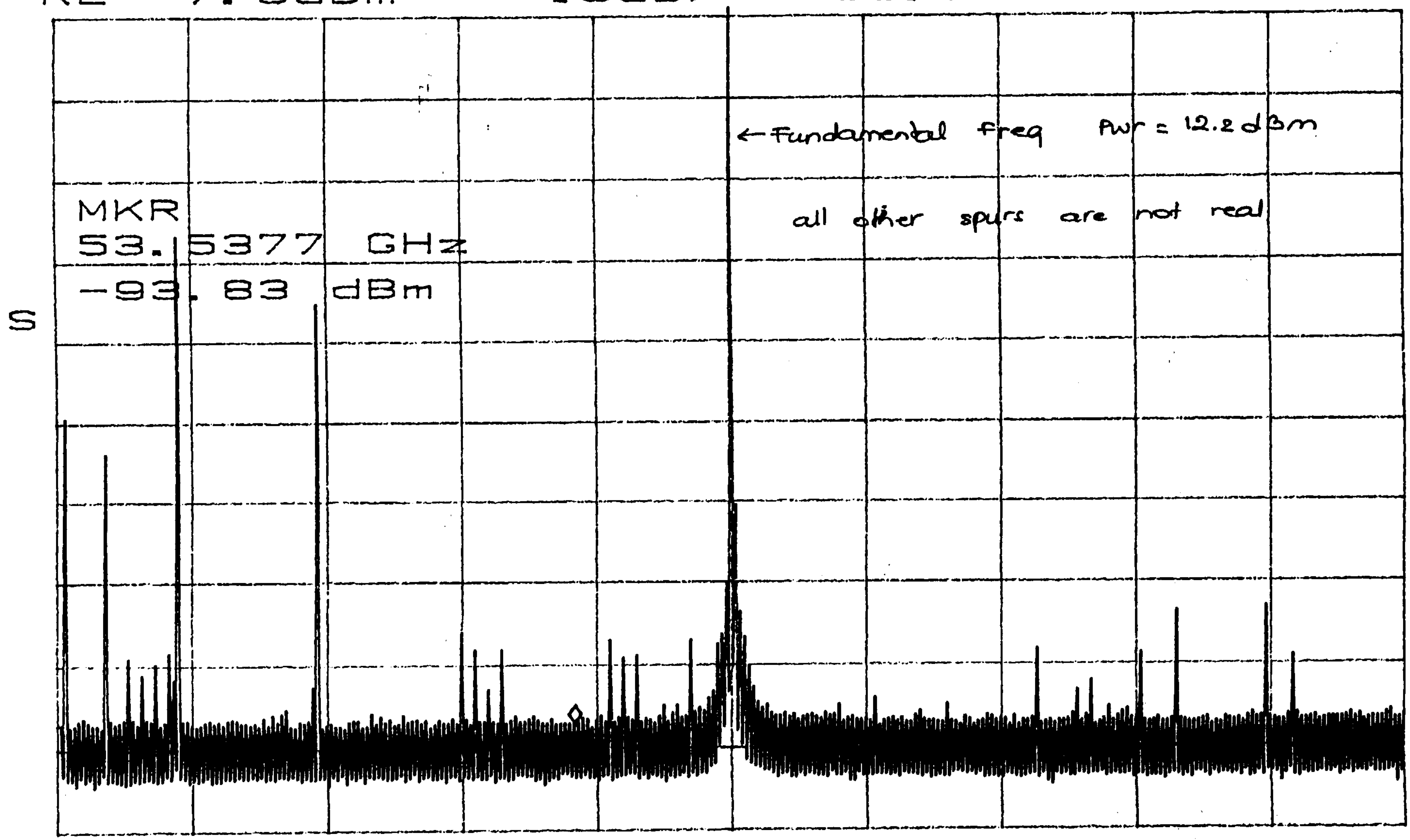


CENTER 52.8000GHz SPAN 500.0MHz
*RBW 10kHz *VBW 1.0kHz SWP 130sec

22°C
S/N: 2 136
7-29-98
DH

SPURIOUS

CL 23.0dB
RL -7.0dBm
10dB/
MKR -93.83dBm
53.5377GHz



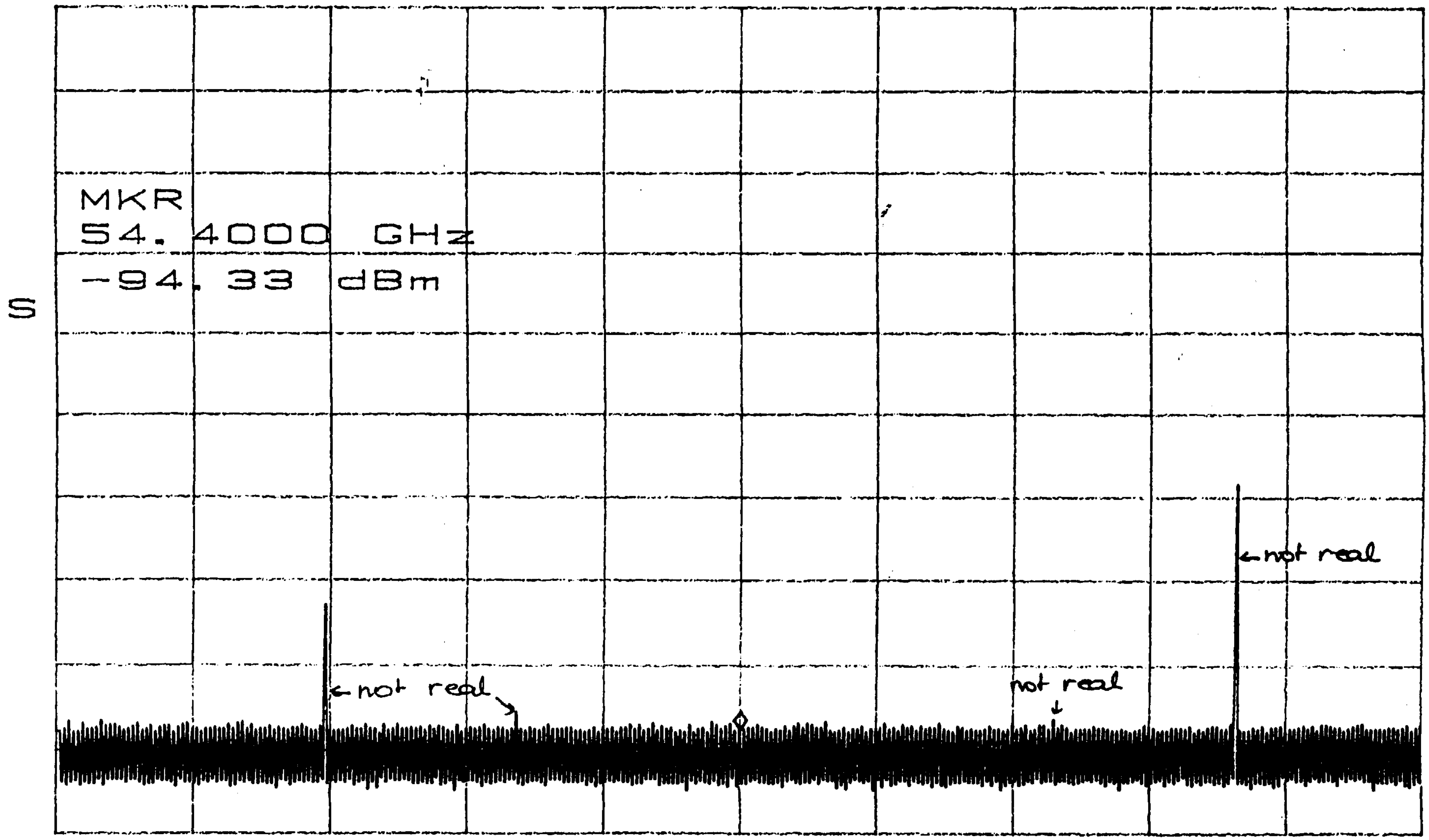
CENTER 53.5960GHz
*RBW 10kHz
*VBW 1.0kHz
SPAN 500.0MHz
SWP 130sec

S/N : 036
7-29-98
DM

SPURIOUS

CL 23.0dB
RL -7.0dBm   10dB/

MKR -94.33dBm
54.4000GHz

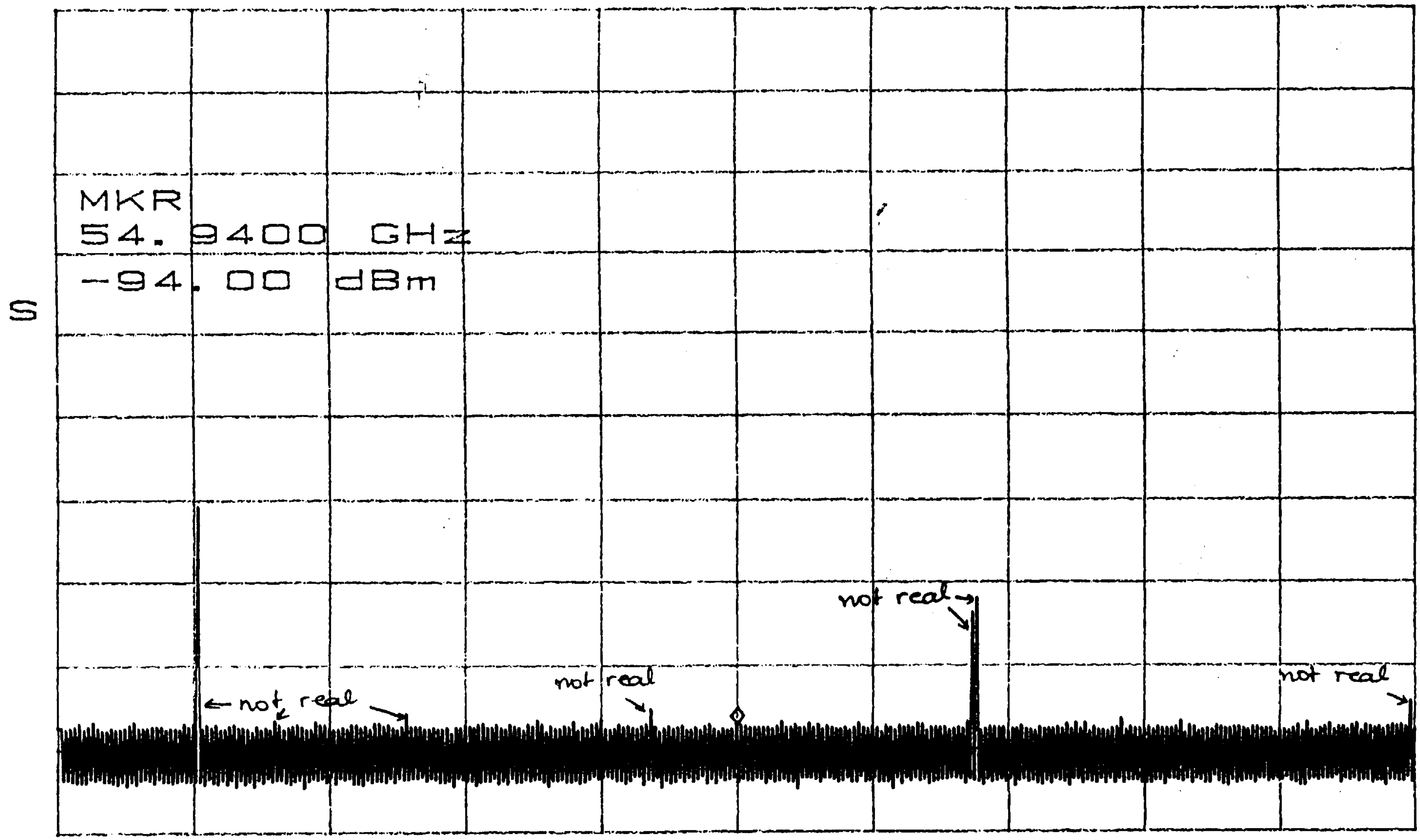


CENTER 54.4000GHz   SPAN 500.0MHz
*RBW 10kHz   *VBW 1.0kHz   SWP 130sec

22°C
S/N. 036
7-29-98
DM

SPURIOUS

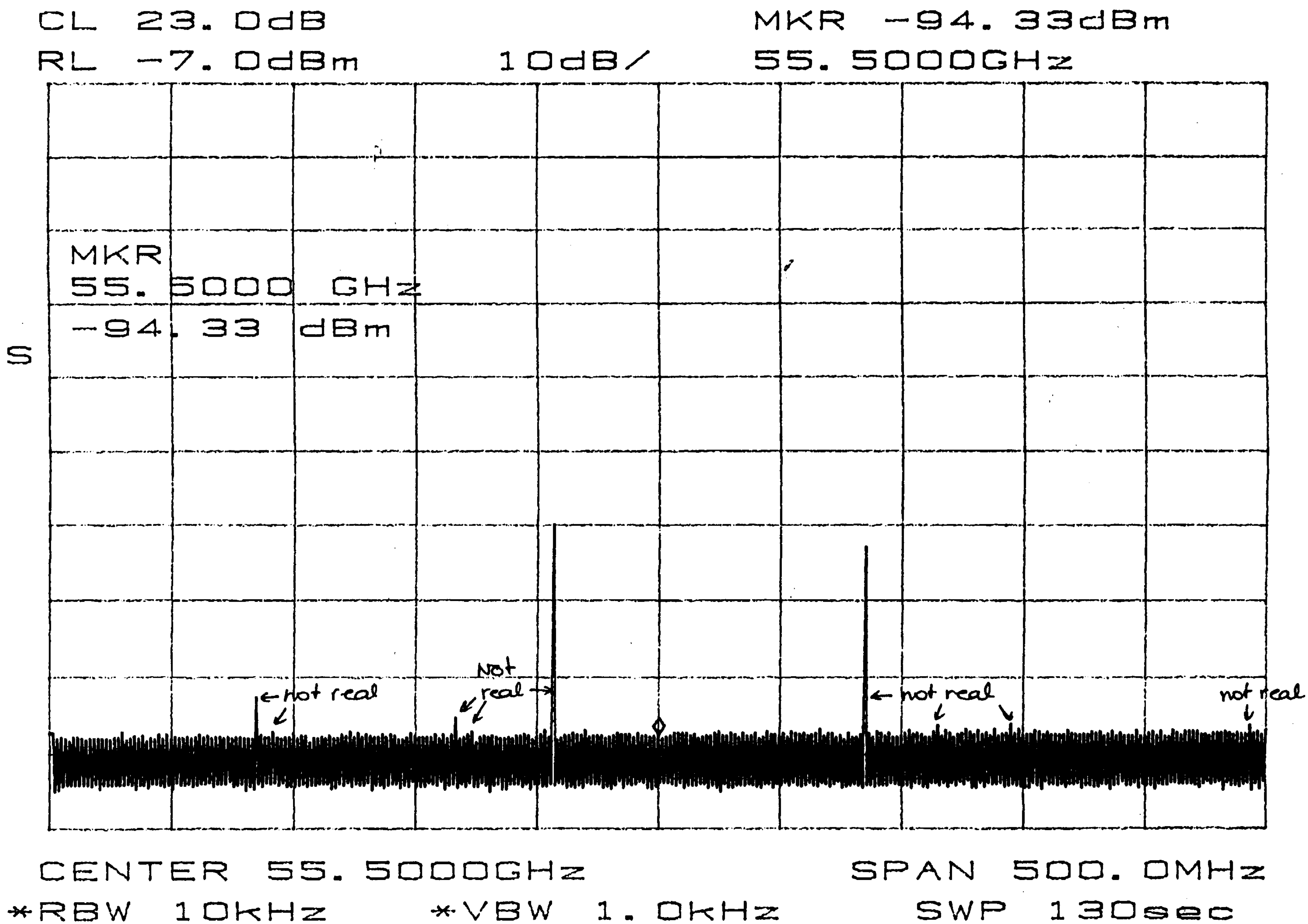
CL 23.0dB MKR -94.00dBm
RL -7.0dBm 10dB/ 54.9400GHz



CENTER 54.9400GHz SPAN 500.0MHz
*RBW 10kHz *VBW 1.0kHz SWP 130sec

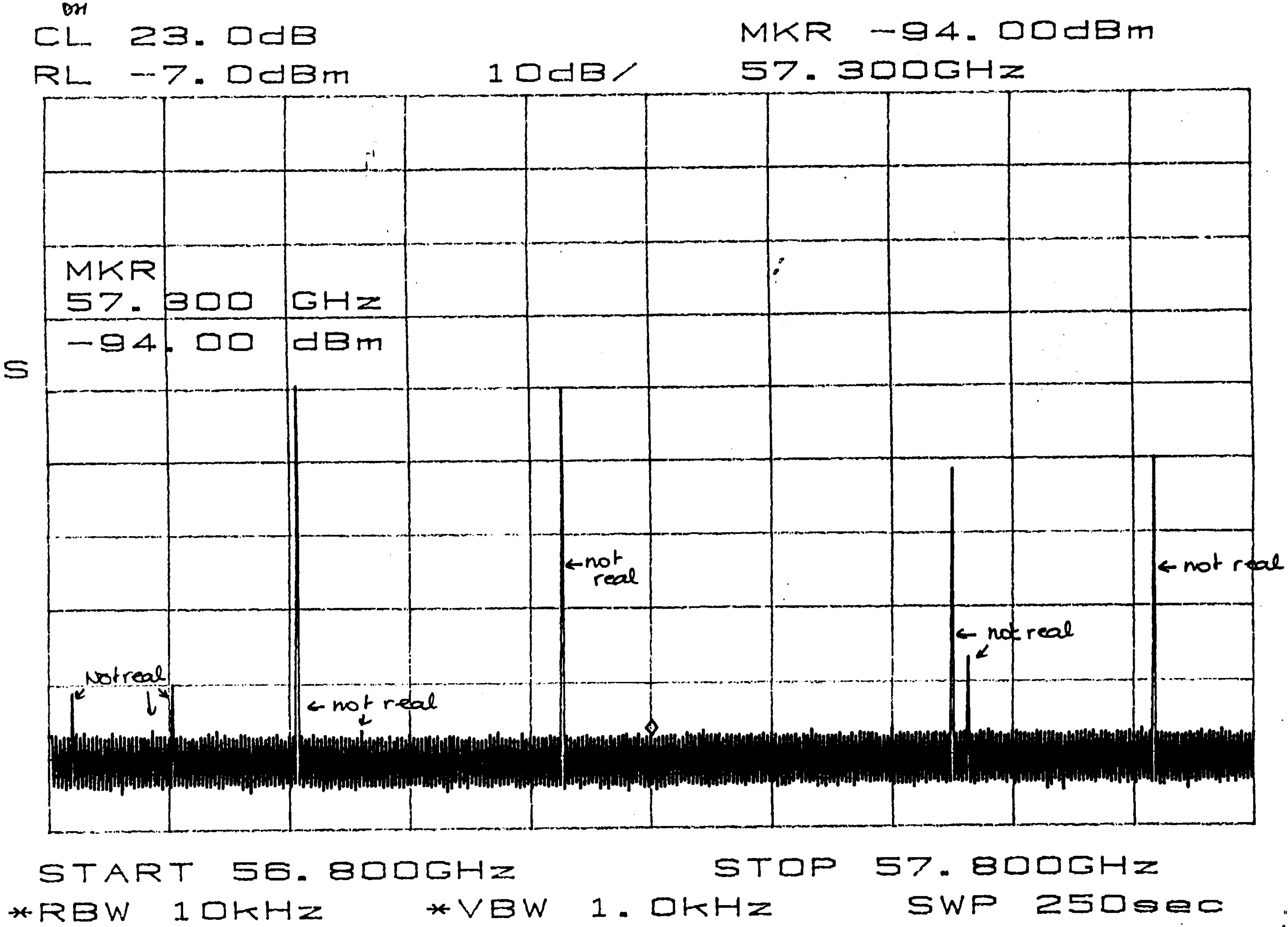
S/N :5036
7-29-98
DH

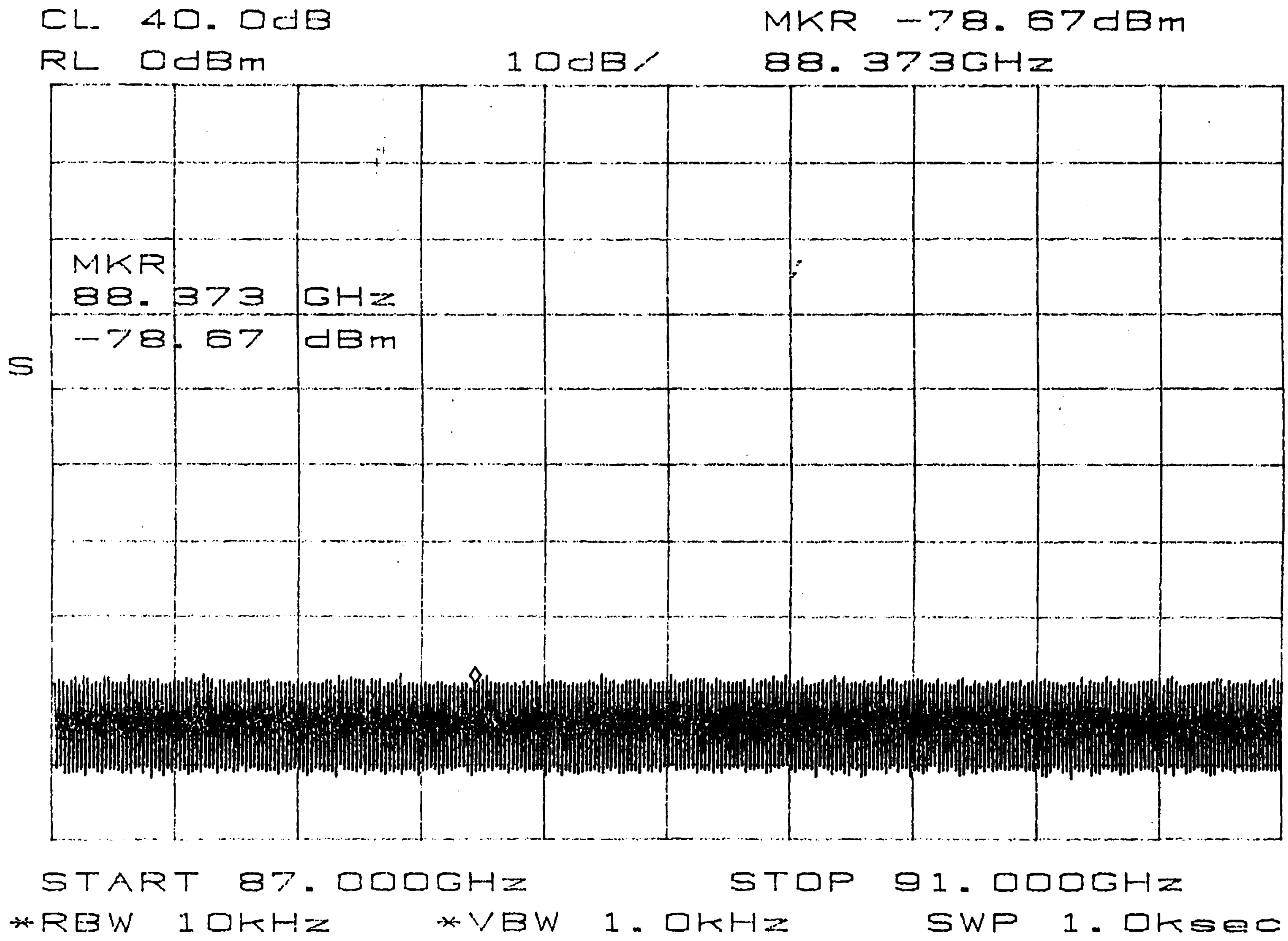
SPURIOUS



si 8503G
7-29-98
DH

SPURIOUS




CL 40.0dB
RL 0dBm
10dB/
MKR -78.67dBm
88.373GHz
MKR
88.373 GHz
-78.67 dBm
S
START 87.000GHz
STOP 91.000GHz
*RBW 10kHz
*VBW 1.0kHz
SWP 1.0ksec

LITTON
Solid State

TEST DATA SHEET 7.13
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AG/A AESD 1336610- 5
SERIAL NUMBER: 85036 QUAL TEST N/A ACCEPT TEST ✓

FM Noise: Ref. Test Para. 5.6.1

TEST DESCRIPTION			LIMITS
FM noise (Attach plot):			
Temperature		22 °C	Tnom ± 1°C
Measured	=	<-115 dBc/Hz 1 MHz to 40 MHz	-100 dBc/Hz max.
Measured	=	<-120 dBc/Hz 40 MHz to 400 MHz	-100 dBc/Hz max.

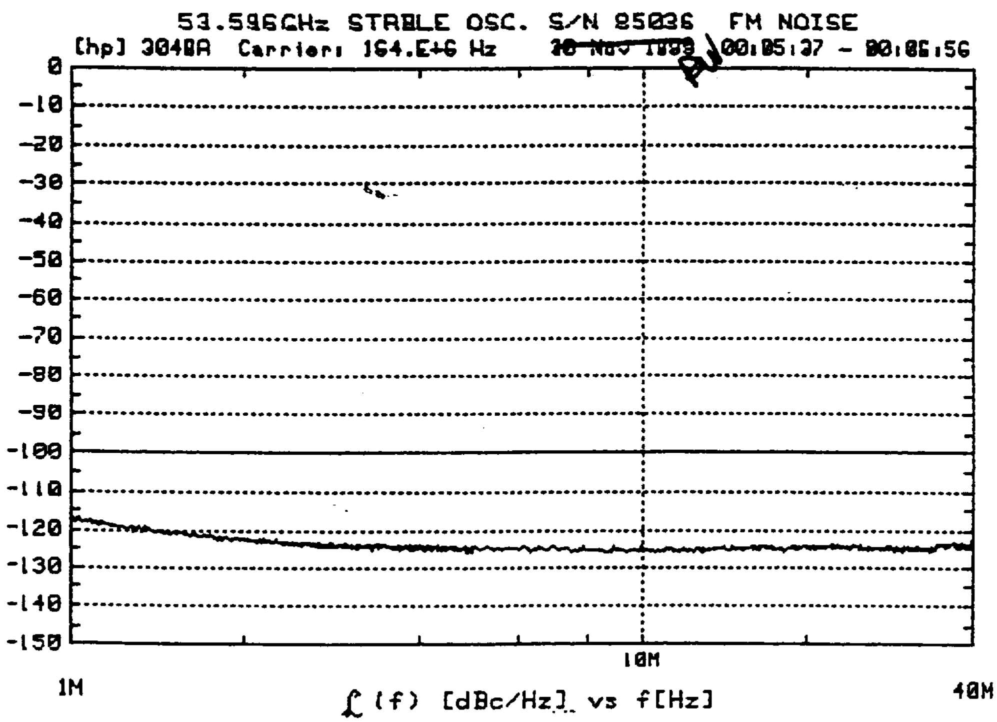
Accept ✓ Reject ______

Test Performed by PH Date 7-29-98

Litton Q.A. LITTON Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 49 OF 68
56348	A	1300823	C	

7-29-98



53.596GHz STABLE OSC. S/N 85036 FM NOISE
[hp] 3048A Carrier: 164.E+6 Hz ~~20 Nov 1989~~ 00:05:37 - 00:06:56
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
10M
1M
40M
ℒ(f) [dBc/Hz] vs f[Hz]

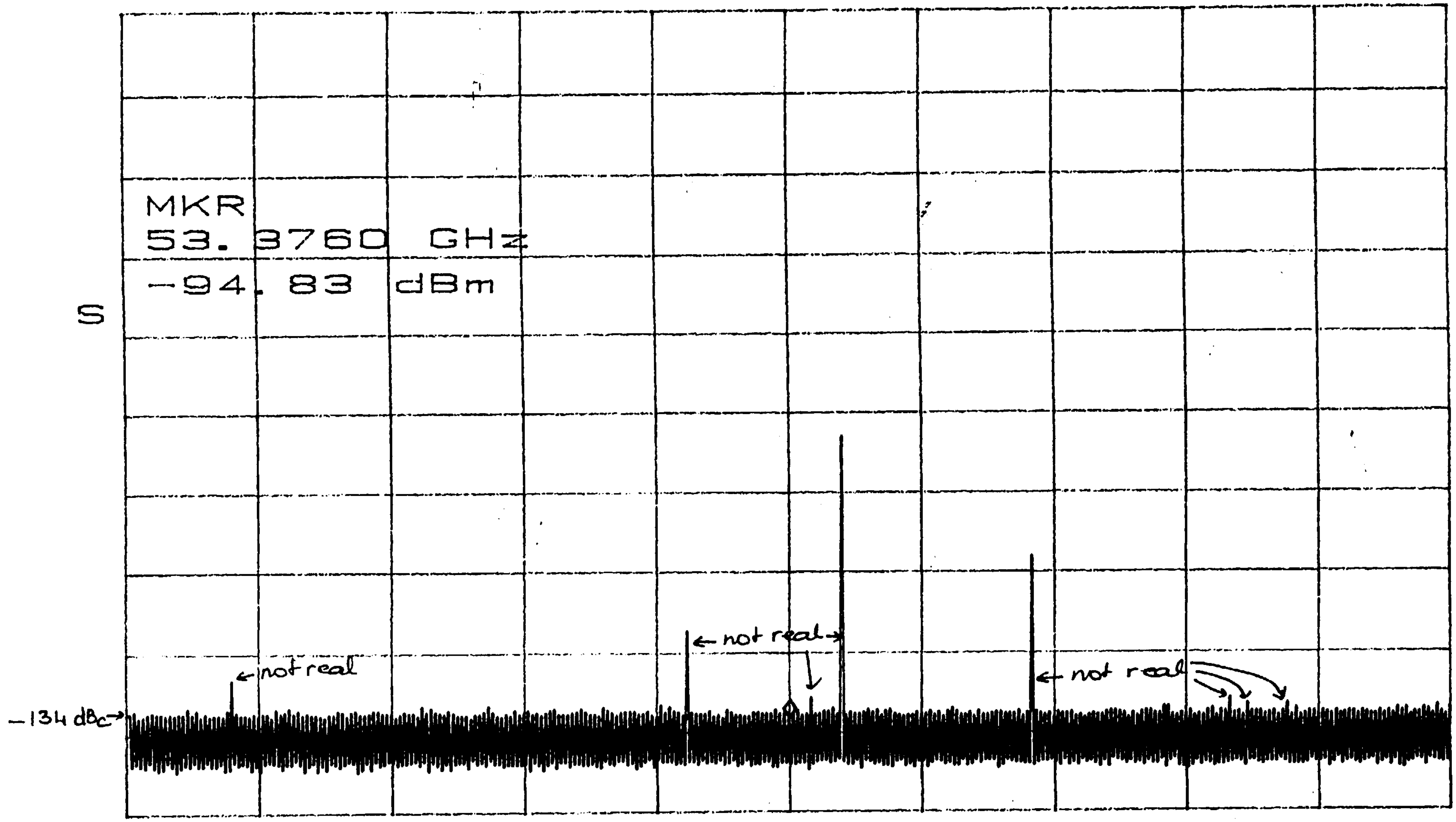
22°C
S/N : 36
7-29-98
DH

FM NOISE (from −400MHz → −40MHz)

CL 23. 0dB
RL −7. 0dBm

10dB/

MKR −94. 83dBm
53. 3760GHz

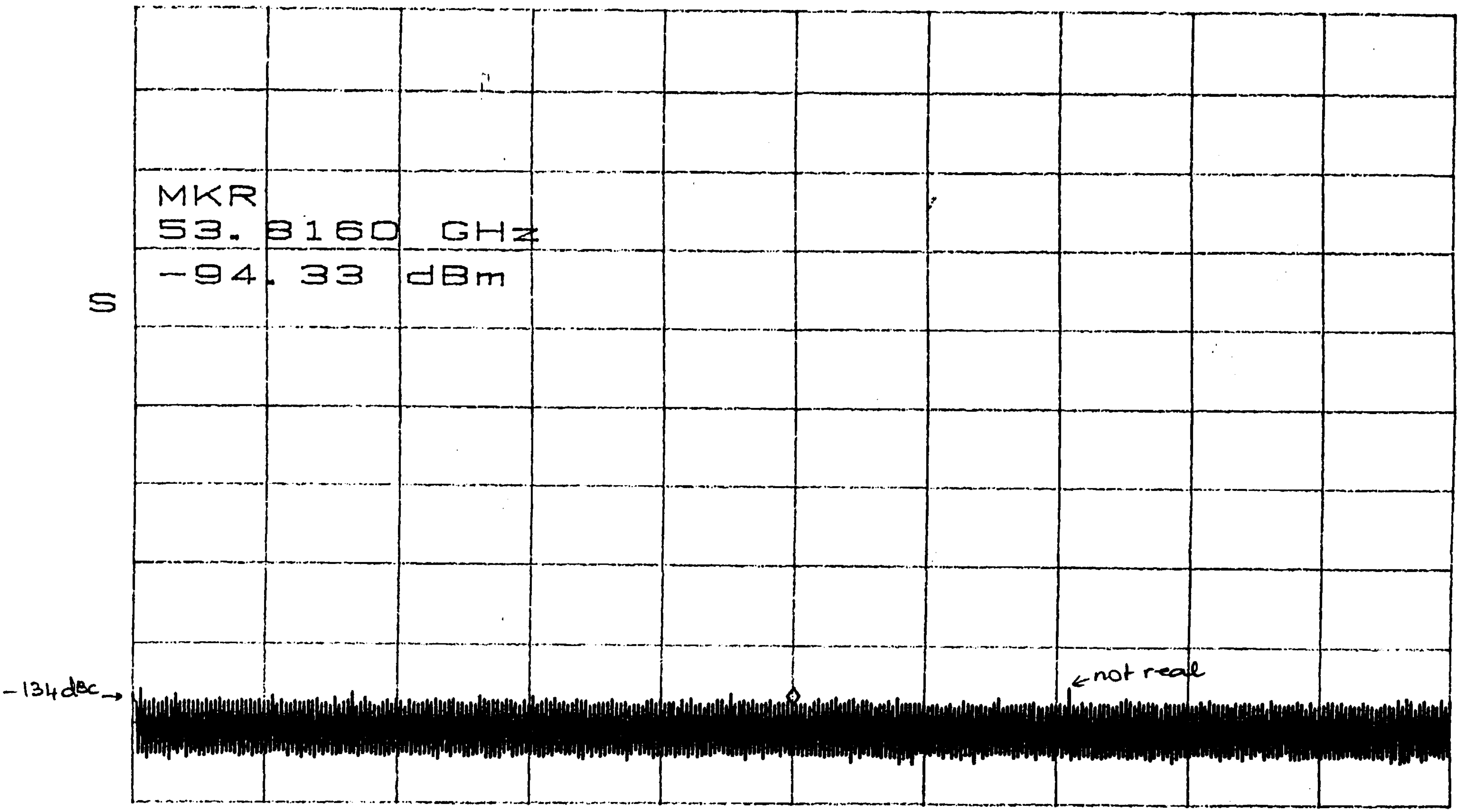


START 53. 1960GHz
STOP 53. 5560GHz
*RBW 10kHz
*VBW 1. 0kHz
SWP 90. 0sec

22°C
S/N: 2 136
7-29-98
RM

FM NOISE (from 40MHz → 400MHz)

CL 23.0dB MKR -94.33dBm
RL -7.0dBm 10dB/ 53.8160GHz



START 53.6360GHz STOP 53.9960GHz
*RBW 10kHz *VBW 1.0kHz SWP 90.0sec

LITTON
Solid State

TEST DATA SHEET 7.16
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9636 AG/A AESD 1336610- 5
SERIAL NUMBER: 85036 QUAL TEST N/A ACCEPT TEST ✓

AM Noise: Ref. Test Para. 5.6.2

TEST DESCRIPTION			LIMITS
AM noise (Attach plot):			
Temperature		22 °C	Tnom ± 1°C
Measured	=	< ~~-140~~ -135 dBc/Hz 1 kHz to 10 kHz	-135 dBc/Hz max.
Measured	=	<-150 dBc/Hz 10 kHz to 100 kHz	-145 dBc/Hz max.
Measured	=	<-160 dBc/Hz at 100 kHz to 40 MHz	-150 dBc/Hz max.

RF Power Input, Mixer (Nominal), P_{mixer}	7 dBm	0 to 7 dBm
RF Voltage, Termination (Nominal), $V_{carrier}$	.083 V	
RF Voltage, Termination (attn -.5dB), $V_{-.5dB}$	.095 V	
RF Voltage, Termination (attn +.5dB), $V_{+.5dB}$	.074 V	
Calculate mixer carrier power, $P_{carrier} = V^2_{carrier} / 50$: $P_{carrier}$ =	-8.61 dBm	
Calculate -.5dB carrier power, $P_{-.5dB} = V^2_{-.5dB} / 50$: $P_{-.5dB}$ =	-7.44 dB	
Calculate +.5dB carrier power, $P_{+.5dB} = V^2_{+.5dB} / 50$: $P_{+.5dB}$ =	-9.61 dBm	
Calculate Mixer Transfer Correction Factor, $CF_{mixer} = P_{-.5dB} - P_{+.5dB} - 1$ dB : CF_{mixer} =	1.17 dB	
Noise (spectrum analyzer), Lmeas	-103 dB	
Total Gain, LNA, G_{LNA}	64 dB	
Calculate Noise of UUT, $L_f = L_{meas} - P_{carrier} - G_{LNA} - CF_{mixer}$: L_f =	-159 dBc/Hz at 40 MHz to 400 MHz	-150 dBc/Hz max

Accept ✓ Reject ______

Test Performed by [initials] Date 7-29-98

Litton Q.A. [stamp: LITTON] Date JUL 30 1998

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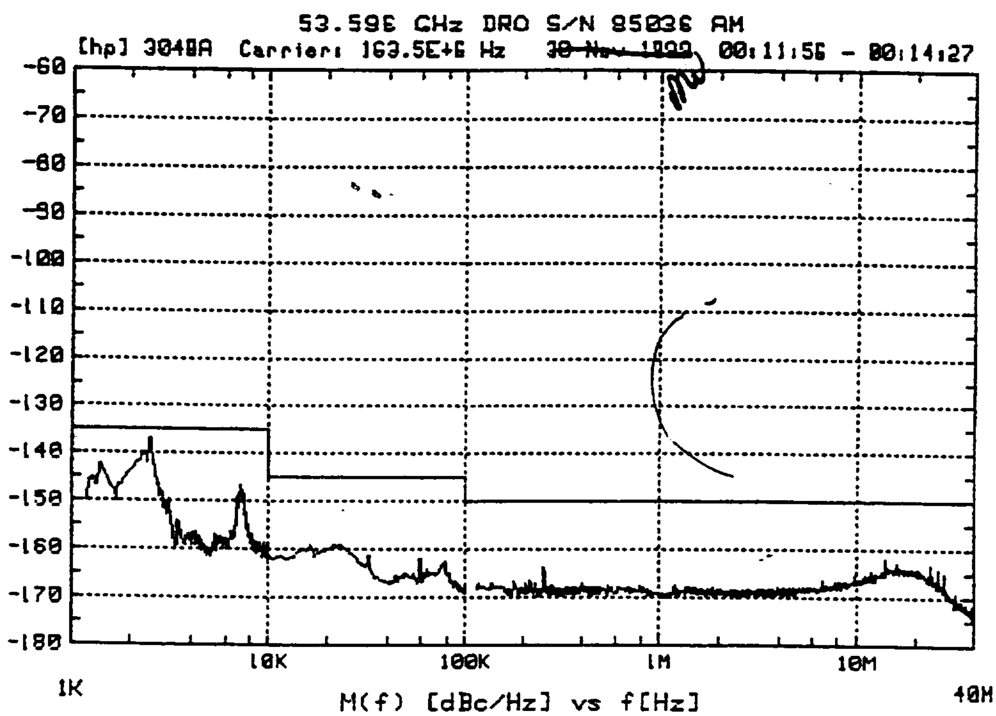
7-29-98

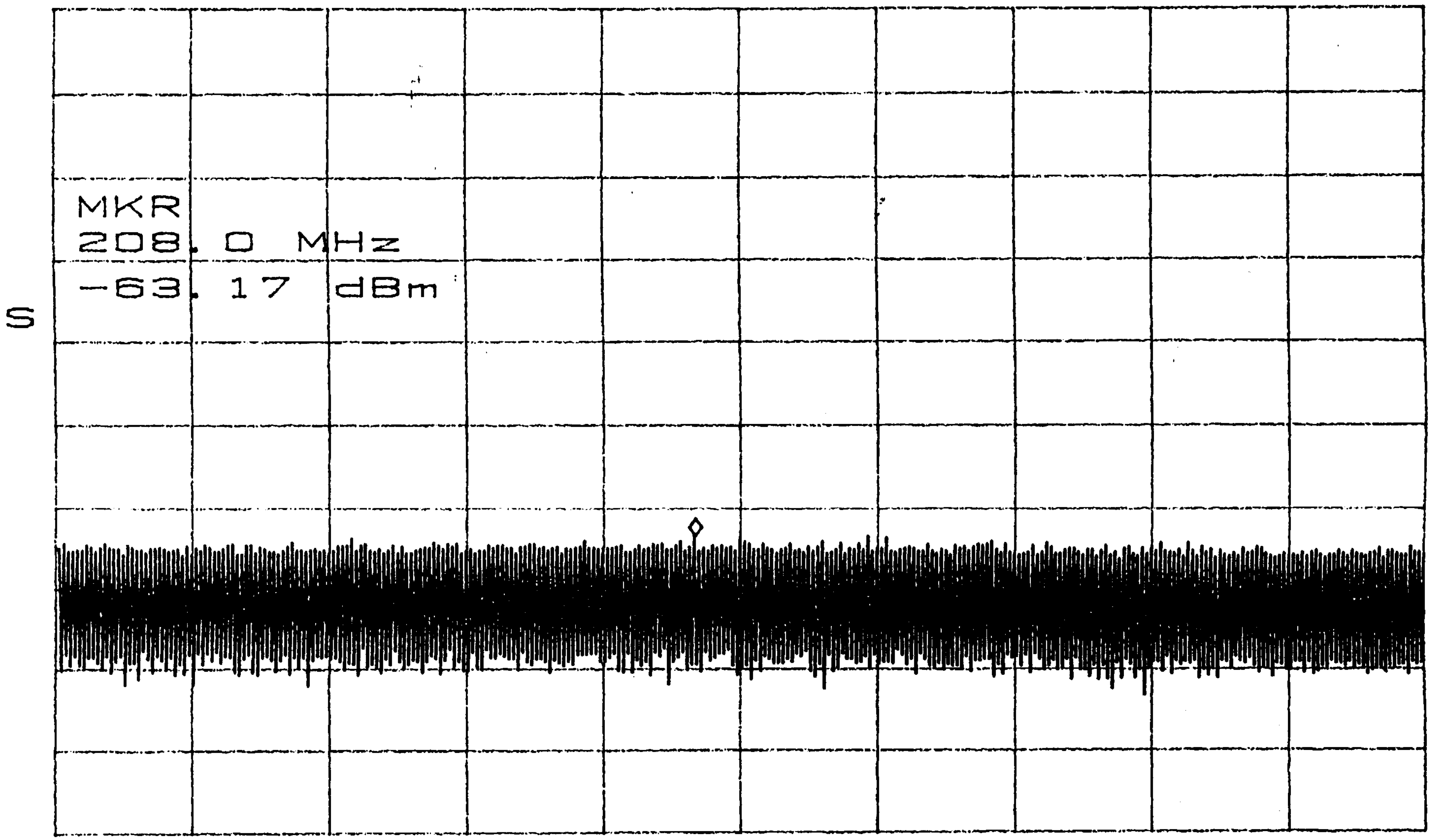


53.596 GHz DRO S/N 85036 AM
[hp] 3048A Carrier: 163.5E+6 Hz ~~30 Nov 1899~~ 00:11:56 - 00:14:27
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
1K
10K
100K
1M
10M
40M
M(f) [dBc/Hz] vs f[Hz]

22°
S/N 5036
7-29-98
DM

AM Noise (from 40MHz → 400MHz)

ATTEN 10dB MKR -63.17dBm
RL 0dBm 10dB/ 208.0MHz



START 40.0MHz STOP 400.0MHz
*RBW 10kHz *VBW 1.0kHz SWP 90.0sec

TEST DATA SHEET 7.19
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AG/A AESD 1336610- 5
SERIAL NUMBER: 85036 QUAL TEST N/A ACCEPT TEST ✓

Harmonics Tests: Ref. Test Para. 5.7

TEST DESCRIPTION		LIMITS
Temperature	22 °C	Tnom ± 1°C
Frequency, per 5.7.1	53.59646 GHz	Table IIIB
RF Output Power, per 5.7.1	12.2 dBm	11.5 to 17 dBm

Harmonics:

Level of second Harmonic	-74 dBm	
Difference (2nd Harmonic)	-86 dB	-30 dBc min

Subharmonics:

Level of Subharmonic	-87 dBm	
Difference (Subharmonic)	-99 dB	-90 dBc min

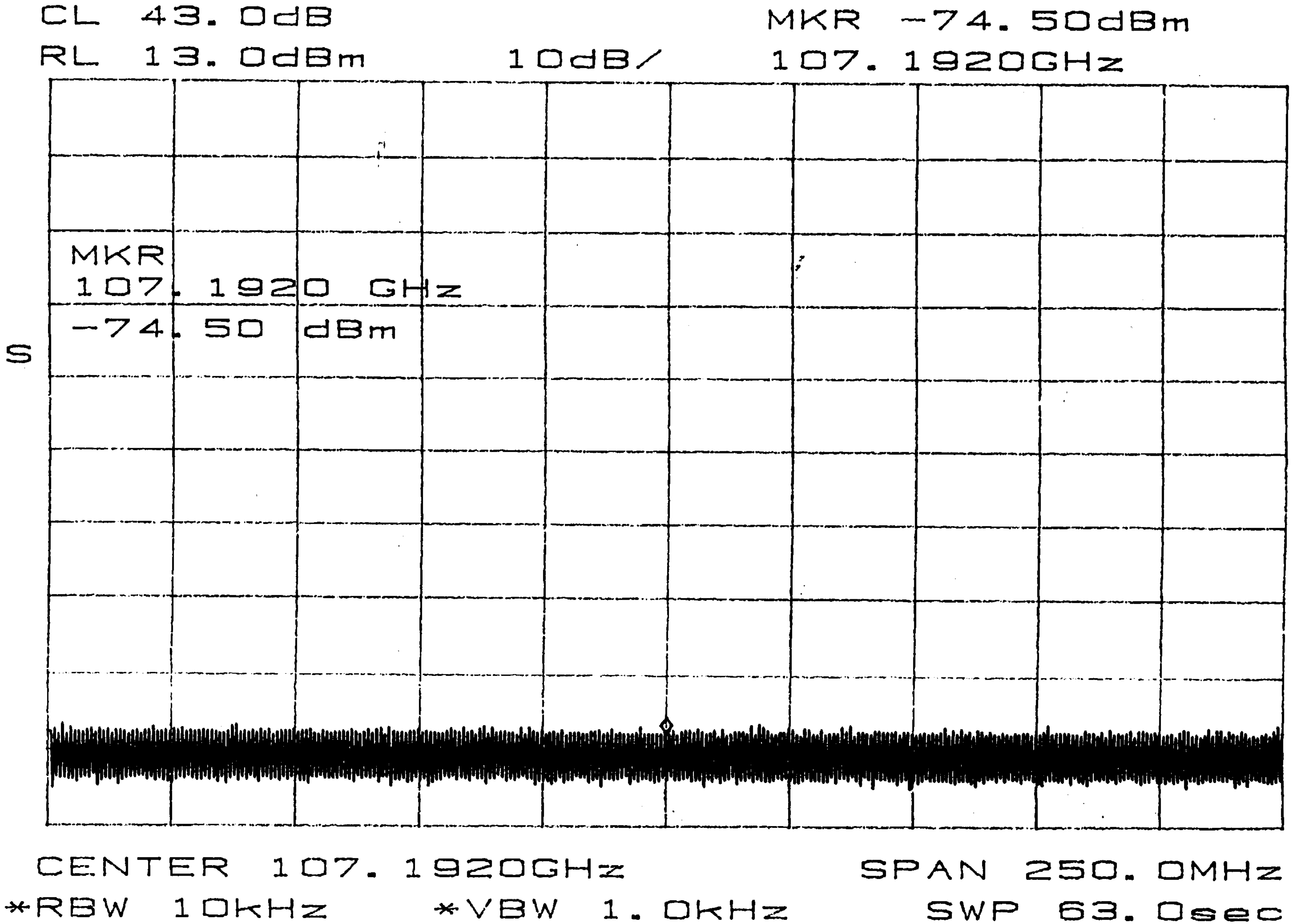
Accept ✓ Reject ________

Test Performed by DH Date 7-29-98

Litton Q.A. LITTON M 60 Date JUL 30 1998

22°C
S/N: 1036
7-29-98
DH

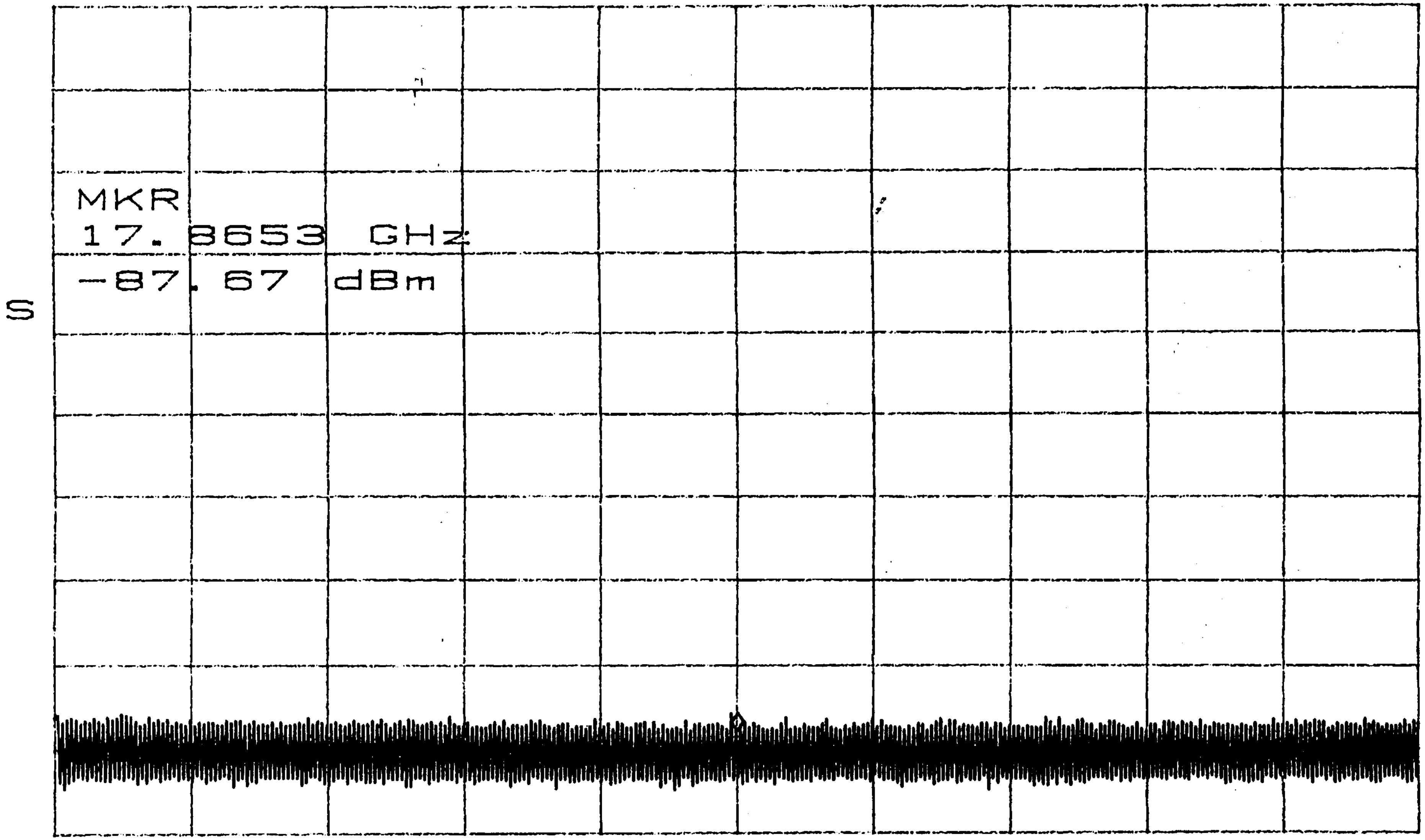
2nd harmonic



22°C
S/N .036
7-29-98
DH

sub-harmonic

ATTEN 10dB
RL 0dBm
10dB/
MKR -87.67dBm
17.8653GHz



CENTER 17.8653GHz
SPAN 250.0MHz
*RBW 10kHz
*VBW 1.0kHz
SWP 63.0sec

TEST DATA SHEET 7.22A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AG/A
SERIAL NUMBER: 85036
QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION			LIMITS
1. Initial Performance at Tnom ± 1°C			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{Tnom}	53.59646	GHz	Table IIIB
RF Output Power, P_{Tnom}	12.2	dBm	11.5 to 17 dBm
Input Voltage, V_B	10	VDC	10 ± 0.2 VDC
Input Current, I_B	180	mA	Table IIIB
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.46	MHz	
2. Performance at Tnom ± 1°C after +60°C soak.			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	53.59614	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	11.5 to 17 dBm
Input Voltage	10	VDC	V_B ± .005 VDC
Input Current	181	mA	Table IIIB
3. Performance at Tnom ± 1°C after -30°C soak.			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	53.59661	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	11.5 to 17 dBm
Input Voltage	10	VDC	V_B ± .005 VDC
Input Current	179	mA	Table IIIB

Calculate frequency variation, $\Delta f_H = f_{meas} - f_{Tnom}$:
Δf_H after 60°C soak = -0.32 MHz
Δf_H after -30°C soak = +0.15 MHz

Calculate RF output power variation, $\Delta P_H = P_{meas} - P_{Tnom}$:
ΔP_H = after 60°C soak = 0.1 dB
ΔP_H = after -30°C soak = 0 dB

Accept ✓ Reject

Test Performed by DH Date 7-29-98
Litton Q.A. Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
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LITTON
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TEST DATA SHEET 7.22B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85036 QUAL TEST N/A

AESD 1336610- 5
ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION — LIMITS

4. Performance at Tnom ± 1°C at Ambient Pressure

TEST DESCRIPTION	Value	Unit	LIMITS
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	53.59635	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	11.5 to 17 dBm
Input Voltage, V_B	10	VDC	V_B ± .0005 VDC
Input Current	180	mA	Table IIIB

Calculate frequency variation, $\Delta f_P = f_{meas} - f_{Tnom}$:

Δf_P = – 0.11 MHz

Calculate RF output power variation, $\Delta P_p = P_{meas} - P_{Tnom}$:

ΔP_p = 0.1 dB

Accept ✓ Reject ______

Test Performed by VN Date 7-30-98

Litton Q.A. LITTON Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 59 OF 68
56348	A	1300823	C	

TEST DATA SHEET 7.23A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AG/A
SERIAL NUMBER: 85036
QUAL TEST N/A
AESD 1336610-5
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Initial Measurement. Ref Test Par. 5.9.1			
Temperature	22	°C	24°C ± 5°C
Frequency	53.59635	GHz	Table IIIB
RF Output Power	12.3	dBm	11.5 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current	180	mA	Table IIIB
Reference test. Ref. Test Para. 5.9.3			
Frequency, f_{Ref}	53.59635	GHz	Table IIIB
RF Output Power, P_{Ref}	-4.0	dBm	
Load Pulling Test. Ref. Test Para. 5.9.4			
Maximum Frequency, f_{meas}	53.59636	GHz	Table IIIB
Minimum Frequency, f_{meas}	53.59634	GHz	Table IIIB
Maximum RF Output Power P_{meas}	-3.6	dBm	
Minimum RF Output Power, P_{meas}	-4.3	dBm	

Calculate maximum positive (f_{meas} is greater than f_{Ref}) and negative (f_{meas} is less than f_{Ref}) frequency variation, $\Delta f_L = f_{meas} - f_{Ref}$:

Maximum Positive Δf_L = 0.01 MHz
Maximum Negative Δf_L = -0.01 MHz

Calculate maximum positive (P_{meas} is greater than P_{Ref}) and negative (P_{meas} is less than P_{Ref}) RF Output Power Variation, $\Delta P_L = P_{meas} - P_{Ref}$:

Maximum Positive ΔP_L = 0.4 dB
Maximum Negative ΔP_L = -0.3 dB

Accept ✓ Reject ____

Test Performed by VN Date 7-30-98
Litton Q.A. Date JUL 30 1998

LITTON
Solid State

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AG/A
SERIAL NUMBER: 85036
QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	22	°C	24°C ± 5°C
Frequency:	5.359636	GHz	Table IIIB
RF Output Power:	12.3	dBm	11.5 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current:	180	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	0.74	MHz (Positive)	Table IIIB
	− 0.33	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	1.37	MHz (Positive)	Table IIIB
	− 1.66	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0.5	dB (Positive)	1.0 dB
	− 0.4	dB (Negative)	-1.0 dB

Accept ✓ Reject ________

Test Performed by VN Date 7-30-98

Litton Q.A. ________ Date JUL 30 1998

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A — AESD 1336610- 5
SERIAL NUMBER: 85035 — QUAL TEST N/A — ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	183 mA	Table IIIB
Input Power, P_{diss}	1.83 W DC	P_{diss} max
Frequency, f_{Tnom}	53.59594 GHz	Table IIIB
RF Output Power, P_{Tnom}	11.6 dBm	11.5 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	– 0.06 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	180 mA	Table IIIB
Frequency, f_{meas}	53.59594 GHz	Table IIIB
RF Output Power, P_{meas}	11.6 dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	181 mA	Table IIIB
Frequency, f_{meas}	53.59594 GHz	Table IIIB
RF Output Power, P_{meas}	11.6 dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 VDC = ∅ MHz
Δf_V at 10.5 VDC or at 10.5 VDC = ∅ MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB

Accept ✓ Reject ____

Test Performed by VN — Date 7-28-98
Litton QA LITTON M CO — Date JUL 30 1998

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LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AG/A
SERIAL NUMBER: 85035
QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10	°C	10° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	182	mA	Table IIIB
Input Power, P_{diss}	1.82	W DC	Pdiss max
Frequency, $f_{10°C}$	53.59599	GHz	Table IIIB
RF Output Power, $P_{10°C}$	11.6	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	180	mA	Table IIIB
Frequency, f_{meas}	53.59599	GHz	Table IIIB
RF Output Power, P_{meas}	11.6	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	180	mA	Table IIIB
Frequency, f_{meas}	53.59600	GHz	Table IIIB
RF Output Power, P_{meas}	11.6	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = ∅ MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0.01 MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$) = 0.05 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$) = ∅ dB

Accept ✓ Reject

Test Performed by VN Date 7-28-98
Litton Q.A. LITTON Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	C	

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85035
QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	182	mA	Table IIIB
Input Power, P_{diss}	1.82	W DC	Pdiss max
Frequency, f_{Tmin}	53.59561	GHz	Table IIIB
RF Output Power, P_{Tmin}	11.5	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	180	mA	Table IIIB
Frequency, f_{meas}	53.59561	GHz	Table IIIB
RF Output Power, P_{meas}	11.5	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	180	mA	Table IIIB
Frequency, f_{meas}	53.59561	GHz	Table IIIB
RF Output Power, P_{meas}	11.5	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:
Δf_V at 9.5 VDC or at 9.5 VDC = ϕ MHz
Δf_V at 10.5 VDC or at 10.5 VDC = ϕ MHz
Δf_T at 10.0 VDC ($=f_{Tmin} - f_{Tnom}$) - 0.33 ~~-0.33~~ MHz VN

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = ϕ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ϕ dB
ΔP_T at 10.0 VDC ($=P_{Tmin} - P_{Tnom}$) = - 0.1 dB

Accept ✓ Reject ____

Test Performed by VN Date 7-28-98
Litton Q.A. LITTON M 60 Date JUL 3 0 1998

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85035 QUAL TEST N/A
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30	°C	30° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	184	mA	Table IIIB
Input Power, P_{diss}	1.84	W DC	Pdiss max
Frequency, $f_{30°C}$	53.59595	GHz	Table IIIB
RF Output Power, $P_{30°C}$	11.7	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	30	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	182	mA	Table IIIB
Frequency, f_{meas}	53.59595	GHz	Table IIIB
RF Output Power, P_{meas}	11.7	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	30	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	182	mA	Table IIIB
Frequency, f_{meas}	53.59595	GHz	Table IIIB
RF Output Power, P_{meas}	11.7	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = ∅ MHz
Δf_V at 10.5 VDC or at 10.5 VDC = ∅ MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$) = 0.01 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$) = 0.1 dB

Accept ✓ Reject ______

Test Performed by VN Date 7-28-98
Litton Q.A. ______ Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
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TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AG/A AESD 1336610- 5
SERIAL NUMBER: 85035 QUAL TEST N/A ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	185	mA	Table IIIB
Input Power, P_{diss}	1.85	W DC	Pdiss max
Frequency, f_{Tmax}	53.59574	GHz	Table IIIB
RF Output Power, P_{Tmax}	11.8	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	183	mA	Table IIIB
Frequency, f_{meas}	53.59572	GHz	Table IIIB
RF Output Power, P_{meas}	11.8	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	184	mA	Table IIIB
Frequency, f_{meas}	53.59570	GHz	Table IIIB
RF Output Power, P_{meas}	11.8	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:
Δf_V at 9.5 VDC or at 9.5 VDC = −0.02 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = −0.04 MHz
Δf_T at 10.0V ($= f_{Tmax} - f_{Tnom}$) = −0.20 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($= P_{Tmax} - P_{Tnom}$) = 0.2 dB

Accept ✓ Reject ____

Test Performed by VN Date 7-28-98
Litton Q.A. LITTON 4150 Date JUL 30 1998

LITTON
Solid State

TEST DATA SHEET 7.7
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A AESD 1336610- 5
SERIAL NUMBER: 85035 QUAL TEST N/A ACCEPT TEST ✓

Power Supply Immunity, Ref. Test Para. 5.2.4

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Initial Measurement			
Temperature	22	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	182	mA	Table IIIB
Input Power	1.82	W DC	Pdiss max
Frequency (f_{Tnom})	53.59601	GHz	Table IIIB
RF Output Power	11.6	dBm	11.5 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.01	MHz	

Performance After Short Circuit on Power Supply: Ref Test Para 5.2.4.2

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	182	mA	Table IIIB
Input Power	1.82	W DC	Pdiss max
Frequency	53.59600	GHz	Table IIIB
RF Output Power	11.6	dBm	11.5 to 17 dBm

Over Voltage: Ref Test Para 5.2.4.3

Overvoltage Input Voltage	28	VDC	+28V

Performance After Input Overvoltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	182	mA	Table IIIB
Input Power	1.82	W DC	Pdiss max
Frequency	53.59601	GHz	Table IIIB
RF Output Power	11.6	dBm	11.5 to 17 dBm

Reverse Polarity: Ref Test Para 5.2.4.4

Reverse Input Voltage	-10	VDC	-10.0 ± 0.2 VDC

Performance After Reverse Input Voltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	182	mA	Table IIIB
Input Power	1.82	W DC	Pdiss max
Frequency, f_{Tnom}	53.59602	GHz	Table IIIB
RF Output Power	11.6	dBm	11.5 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.02	MHz	

Accept ✓ Reject ______
Test Performed by VN Date 7-28-98
Litton Q.A. LITTON M 60 Date JUL 30 1998

CODE IDENT NO. 56348	SIZE A	NUMBER 1300823	REV C	SHEET 43 OF 68

LITTON
Solid State

TEST DATA SHEET 7.22A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AG/A
SERIAL NUMBER: 85035 QUAL TEST N/A

AESD 1336610- 5
ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION			LIMITS
1. Initial Performance at Tnom ± 1°C			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{Tnom}	53.59594	GHz	Table IIIB
RF Output Power, P_{Tnom}	11.6	dBm	11.5 to 17 dBm
Input Voltage, V_B	10	VDC	10 ± 0.2 VDC
Input Current, I_B	183	mA	Table IIIB
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	-0.06	MHz	
2. Performance at Tnom ± 1°C after +60°C soak.			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	53.59593	GHz	Table IIIB
RF Output Power, P_{meas}	11.7	dBm	11.5 to 17 dBm
Input Voltage	10	VDC	V_B ± .005 VDC
Input Current	183	mA	Table IIIB
3. Performance at Tnom ± 1°C after -30°C soak.			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	53.59601	GHz	Table IIIB
RF Output Power, P_{meas}	11.6	dBm	11.5 to 17 dBm
Input Voltage	10	VDC	V_B ± .005 VDC
Input Current	182	mA	Table IIIB

Calculate frequency variation, $\Delta f_H = f_{meas} - f_{Tnom}$:
Δf_H after 60°C soak = -0.01 MHz
Δf_H after -30°C soak = 0.07 MHz

Calculate RF output power variation, $\Delta P_H = P_{meas} - P_{Tnom}$:
ΔP_H = after 60°C soak = 0.1 dB
ΔP_H = after -30°C soak = ϕ dB

Accept ✓ Reject ______

Test Performed by VN Date 7-28-98
Litton Q.A. LITTON Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.23A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AG/A
SERIAL NUMBER: 85035 QUAL TEST N/A

AESD 1336610- 5
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Initial Measurement. Ref Test Par. 5.9.1			
Temperature	22	°C	24°C ± 5°C
Frequency	53.59609	GHz	Table IIIB
RF Output Power	11.7	dBm	11.5 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current	183	mA	Table IIIB
Reference test. Ref. Test Para. 5.9.3			
Frequency, f_{Ref}	53.59609	GHz	Table IIIB
RF Output Power, P_{Ref}	-3.2	dBm	
Load Pulling Test. Ref. Test Para. 5.9.4			
Maximum Frequency, f_{meas}	53.59610	GHz	Table IIIB
Minimum Frequency, f_{meas}	53.59608	GHz	Table IIIB
Maximum RF Output Power P_{meas}	-2.9	dBm	
Minimum RF Output Power, P_{meas}	-3.5	dBm	

Calculate maximum positive (f_{meas} is greater than f_{Ref}) and negative (f_{meas} is less than f_{Ref}) frequency variation. $\Delta f_L = f_{meas} - f_{Ref}$:

Maximum Positive Δf_L = 0.01 MHz
Maximum Negative Δf_L = -0.01 MHz

Calculate maximum positive (P_{meas} is greater than P_{Ref}) and negative (P_{meas} is less than P_{Ref}) RF Output Power Variation, $\Delta P_L = P_{meas} - P_{Ref}$:

Maximum Positive ΔP_L = 0.3 dB
Maximum Negative ΔP_L = -0.3 dB

Accept ✓ Reject ________

Test Performed by VN Date 7-29-98
Litton Q.A. LITTON M 60 Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 60 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AG/A AESD 1336610- 5
SERIAL NUMBER: 85035 QUAL TEST N/A ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	22	°C	24°C ± 5°C
Frequency:	53.59608	GHz	Table IIIB
RF Output Power:	11.7	dBm	11.5 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current:	183	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	0.09	MHz (Positive)	Table IIIB
	− 0.13	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	0.06	MHz (Positive)	Table IIIB
	− 0.37	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0.6	dB (Positive)	1.0 dB
	− 0.4	dB (Negative)	-1.0 dB

Accept ✓ Reject ________

Test Performed by VN Date 7-29-98

Litton Q.A. LITTON M 69 Date JUL 3 0 1998

CODE IDENT NO. 56348	SIZE A	NUMBER 1300823	REV C	SHEET 61 OF 68

Report No. 11491
June 1999

Channel 6 LO

DRO (P/N: 1336610-6, S/N: 85026)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AH /A
SERIAL NUMBER: 85026 QUAL TEST N/A
AESD 1336610- 6
ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	180.4 mA	Table IIIB
Input Power, P_{diss}	1.804 W DC	P_{diss} max
Frequency, f_{Tnom}	54.40007 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.3 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	.07 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	178.3 mA	Table IIIB
Frequency, f_{meas}	54.40021 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	179.4 mA	Table IIIB
Frequency, f_{meas}	54.40016 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 VDC = .14 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = .09 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 VDC = -0- dB
ΔP_V at 10.5 VDC or at 10.5 VDC = -0- dB

Accept ✓ Reject ______

Test Performed by 83 Date 6-3-98
Litton QA LITTON 60 Date JUN 15 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AH/A
SERIAL NUMBER: 85026
QUAL TEST N/A
AESD 1336610- 6
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	10 °C	10° ± 1°C
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	179.9 mA	Table IIIB
Input Power, P_{diss}	1.799 W DC	Pdiss max
Frequency, $f_{10°C}$	54.39964 GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.3 dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	10 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	177.8 mA	Table IIIB
Frequency, f_{meas}	54.39964 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	10 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	179.2 mA	Table IIIB
Frequency, f_{meas}	54.39967 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = 0 MHz

Δf_V at 10.5 VDC or at 10.5 VDC = .03 MHz

Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$) = ~~-43~~ MHz
-.43 pw

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB

ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB

ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$) = 0 dB

Accept ✓ Reject ________

Test Performed by ________ Date 6-3-98
Litton Q.A. ________ Date JUN 15 1998

LITTON 60

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS

INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E9036AH/A AESD 1336610- 6
SERIAL NUMBER: 85026 QUAL TEST N/A ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	179.2	mA	Table IIIB
Input Power, P_{diss}	1.792	W DC	Pdiss max
Frequency, f_{Tmin}	54.39839	GHz	Table IIIB
RF Output Power, P_{Tmin}	12.4	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10	VDC	9.5 VDC or Para 5.2.3.2
Input Current	177.1	mA	Table IIIB
Frequency, f_{meas}	54.39841	GHz	Table IIIB
RF Output Power, P_{meas}	12.4	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	179.0	mA	Table IIIB
Frequency, f_{meas}	54.39840	GHz	Table IIIB
RF Output Power, P_{meas}	12.4	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at 9.5 VDC =	.02	MHz
Δf_V at 10.5 VDC or at 10.5 VDC =	.01	MHz
Δf_T at 10.0 VDC ($=f_{Tmin} - f_{Tnom}$)	-1.68	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at 9.5 VDC =	0	dB
ΔP_V at 10.5 VDC or at 10.5 VDC =	0	dB
ΔP_T at 10.0 VDC ($=P_{Tmin} - P_{Tnom}$) =	.1	dB

Accept ✓ Reject ______

Test Performed by SB Date 6-3-98
Litton Q.A. LITTON 8 Date JUN 15 1998

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET n/a FINAL DATA SET ✓

LITTON TYPE LSE 9036AH/A
SERIAL NUMBER: 85026
QUAL TEST N/A
AESD 1336610- C
ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30	°C	30° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	179.8	mA	Table IIIB
Input Power, P_{diss}	1.798	W DC	Pdiss max
Frequency, $f_{30°C}$	54.40013	GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.4	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3
Measurement at 9.5 VDC or at 9.5 VDC

Temperature	30	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	177.8	mA	Table IIIB
Frequency, f_{meas}	54.40021	GHz	Table IIIB
RF Output Power, P_{meas}	12.4	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC

Temperature	30	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	179.0	mA	Table IIIB
Frequency, f_{meas}	54.40019	GHz	Table IIIB
RF Output Power, P_{meas}	12.4	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:
Δf_V at 9.5 VDC or at 9.5 VDC = .08 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = .06 MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$) = .06 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = -0- dB
ΔP_V at 10.5 VDC or at 10.5 VDC = -0- dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$) = .1 dB

Accept ✓ Reject ______

Test Performed by ______ Date 6-4-98
Litton Q.A. LITTON M-60 Date JUN 15 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

LITTON

Solid State

TEST DATA SHEET 7.6

FUNCTIONAL PERFORMANCE TESTS

INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AH/A — AESD 1336610- 6

SERIAL NUMBER: 85026 — QUAL TEST N/A — ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	44 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	181.0 mA	Table IIIB
Input Power, P_{diss}	1.810 W DC	Pdiss max
Frequency, f_{Tmax}	54.40127 GHz	Table IIIB
RF Output Power, P_{Tmax}	12.1 dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	44 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para 5.2.3.2
Input Current	179.0 mA	Table IIIB
Frequency, f_{meas}	54.40125 GHz	Table IIIB
RF Output Power, P_{meas}	12.1 dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	44 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para 5.2.3.3
Input Current	179.6 mA	Table IIIB
Frequency, f_{meas}	54.40127 GHz	Table IIIB
RF Output Power, P_{meas}	12.1 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at 9.5 VDC = -.02 MHz

Δf_V at 10.5 VDC or at 10.5 VDC = 0 MHz

Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$) = 1.2 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB

ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB

ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$) = -.2 dB

Accept ✓ Reject ______

Test Performed by SB — Date 6-3-98

Litton Q.A. — Date JUN 15 1998

LITTON M 60

LITTON
Solid State

TEST DATA SHEET 7.7
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AH/A AESD 1336610- 6
SERIAL NUMBER: 85026 QUAL TEST N/A ACCEPT TEST ✓

Power Supply Immunity. Ref. Test Para. 5.2.4

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Initial Measurement			
Temperature	22	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180.4	mA	Table IIIB
Input Power	1.804	W DC	Pdiss max
Frequency (f_{Tnom})	54.39994	GHz	Table IIIB
RF Output Power	12.4	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	+.06	MHz	

Performance After Short Circuit on Power Supply: Ref Test Para 5.2.4.2

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180.5	mA	Table IIIB
Input Power	1.805	W DC	Pdiss max
Frequency	54.40003	GHz	Table IIIB
RF Output Power	12.4	dBm	12 to 17 dBm

Over Voltage: Ref Test Para 5.2.4.3

Overvoltage Input Voltage	28	VDC	+28V

Performance After Input Overvoltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180.2	mA	Table IIIB
Input Power	1.802	W DC	Pdiss max
Frequency	54.39999	GHz	Table IIIB
RF Output Power	12.4	dBm	12 to 17 dBm

Reverse Polarity: Ref Test Para 5.2.4.4

Reverse Input Voltage	-10	VDC	-10.0 ± 0.2 VDC

Performance After Reverse Input Voltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	180.4	mA	Table IIIB
Input Power	1.804	W DC	Pdiss max
Frequency, f_{Tnom}	54.39995	GHz	Table IIIB
RF Output Power	12.4	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	+.05	MHz	

Accept ✓ Reject ____
Test Performed by S3 Date 6-5-98
Litton Q.A. LITTON M 60 Date JUN 15 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 43 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.22A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AH/A | AESD 1336610- 6
SERIAL NUMBER: ______ | QUAL TEST N/A | ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION		LIMITS
1. Initial Performance at Tnom ± 1°C		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{Tnom}	54.40007 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.3 dBm	12 to 17 dBm
Input Voltage, V_B	10 VDC	10 ± 0.2 VDC
Input Current, I_B	180.4 mA	Table IIIB
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	.07 MHz	
2. Performance at Tnom ± 1°C after +60°C soak.		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{meas}	54.39999 GHz	Table IIIB
RF Output Power, P_{meas}	12.4 dBm	12 to 17 dBm
Input Voltage	10 VDC	V_B ± .005 VDC
Input Current	180.6 mA	Table IIIB
3. Performance at Tnom ± 1°C after -30°C soak.		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{meas}	54.40012 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm
Input Voltage	10 VDC	V_B ± .005 VDC
Input Current	180.1 mA	Table IIIB

Calculate frequency variation, $\Delta f_H = f_{meas} - f_{Tnom}$:
Δf_H after 60°C soak = .08 MHz
Δf_H after -30°C soak = -.05 MHz

Calculate RF output power variation, $\Delta P_H = P_{meas} - P_{Tnom}$:
ΔP_H = after 60°C soak = +.1 dB
ΔP_H = after -30°C soak = 0 dB

Accept ✓ Reject ______

Test Performed by 83 Date 6-4-98
Litton Q.A. Date JUN 15 1998

LITTON M 60

LITTON

Solid State

TEST DATA SHEET 7.23A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AH/A
SERIAL NUMBER: 85026 QUAL TEST N/A

AESD 1336610-6
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Initial Measurement. Ref Test Par. 5.9.1		
Temperature	22 °C	24°C ± 5°C
Frequency	54.40074 GHz	Table IIIB
RF Output Power	12.2 dBm	12 to 17 dBm
Input Voltage	10 VDC	10 ± 0.2 VDC
Input Current	180.3 mA	Table IIIB
Reference test. Ref. Test Para. 5.9.3		
Frequency, f_{Ref}	54.40083 GHz	Table IIIB
RF Output Power, P_{Ref}	-6.8 dBm	
Load Pulling Test. Ref. Test Para. 5.9.4		
Maximum Frequency, f_{meas}	54.40084 GHz	Table IIIB
Minimum Frequency, f_{meas}	54.40082 GHz	Table IIIB
Maximum RF Output Power P_{meas}	-6.7 dBm	
Minimum RF Output Power, P_{meas}	-7.3 dBm	

Calculate maximum positive (f_{meas} is greater than f_{Ref}) and negative (f_{meas} is less than f_{Ref}) frequency variation, $\Delta f_L = f_{meas} - f_{Ref}$:

Maximum Positive Δf_L = 0.01 MHz
Maximum Negative Δf_L = -0.01 MHz

Calculate maximum positive (P_{meas} is greater than P_{Ref}) and negative (P_{meas} is less than P_{Ref}) RF Output Power Variation, $\Delta P_L = P_{meas} - P_{Ref}$:

Maximum Positive ΔP_L = 0.1 dB
Maximum Negative ΔP_L = -0.5 dB

Accept ✓ Reject ______

Test Performed by 53 Date 6-5-98
Litton Q.A. LITTON 48 Date JUN 15 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 60 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AH/A
SERIAL NUMBER: 80026
QUAL TEST N/A
AESD 1336610- C
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	22	°C	24°C ± 5°C
Frequency:	54.40074	GHz	Table IIIB
RF Output Power:	12.2	dBm	12 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current:	180.3	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	0.16	MHz (Positive)	Table IIIB
	− 0.06	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	1.34	MHz (Positive)	Table IIIB
	− 1.70	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0.3	dB (Positive)	1.0 dB
	− 0.7	dB (Negative)	-1.0 dB

Accept ✓ Reject ______

Test Performed by SB Date 6-5-98

Litton Q.A. LITTON M 60 Date JUN 15 1998

Report No. 11491
June 1999

Channel 7 LO

DRO (P/N: 1336610-7, S/N: 85017)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET —— FINAL DATA SET ✓

LITTON TYPE LS E-9036 A5/A
SERIAL NUMBER: 85019 QUAL TEST ——
AESD 1336610-7
ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	23 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	176 mA	Table IIIB
Input Power, P_{diss}	1.76 W DC	P_{diss} max
Frequency, f_{Tnom}	54.94017 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.2 dBm	11.5 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	.17 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at —— VDC		
Temperature	23 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	174 mA	Table IIIB
Frequency, f_{meas}	54.94017 GHz	Table IIIB
RF Output Power, P_{meas}	12.2 dBm	11.5 to 17 dBm
Measurement at 10.5 VDC or at —— VDC		
Temperature	23 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	175 mA	Table IIIB
Frequency, f_{meas}	54.94017 GHz	Table IIIB
RF Output Power, P_{meas}	12.2 dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at —— VDC = Ø MHz
Δf_V at 10.5 VDC or at —— VDC = Ø MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at —— VDC = Ø dB
ΔP_V at 10.5 VDC or at —— VDC = Ø dB

Accept ✓ Reject ____

Test Performed by D. Williams Date 4/26/99
Litton QA FSS M18 Date APR 29 1999

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET ___—___ FINAL DATA SET ✓

LITTON TYPE LS E-9036 AJ/A
SERIAL NUMBER: 85017
QUAL TEST ___—___
AESD 1336610-7
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	11 °C	10° ± 1°C
Input Voltage	10.0 VDC	10.0 ± 0.2 VDC
Input Current	175 mA	Table IIIB
Input Power, P_{diss}	1.75 W DC	Pdiss max
Frequency, $f_{10°C}$	54.93994 GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.1 dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at ___—___ VDC		
Temperature	11 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	173 mA	Table IIIB
Frequency, f_{meas}	54.93994 GHz	Table IIIB
RF Output Power, P_{meas}	12.1 dBm	11.5 to 17 dBm
Measurement at 10.5 VDC or at ___—___ VDC		
Temperature	11 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	174 mA	Table IIIB
Frequency, f_{meas}	54.93994 GHz	Table IIIB
RF Output Power, P_{meas}	12.1 dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at ___—___ VDC = Ø MHz
Δf_V at 10.5 VDC or at ___—___ VDC = Ø MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$) = -.23 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at ___—___ VDC = Ø dB
ΔP_V at 10.5 VDC or at ___—___ VDC = Ø dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$) = -.1 dB

Accept ✓ Reject ________

Test Performed by D. WILLIAMS Date 4/26/99
Litton Q.A. FSS M18 Date APR 29 1999

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET — FINAL DATA SET ✓

LITTON TYPE LS E-9036 AS/A AESD 1336610- 7
SERIAL NUMBER: 85017 QUAL TEST — ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	174	mA	Table IIIB
Input Power, P_{diss}	1.74	W DC	Pdiss max
Frequency, f_{Tmin}	54.93971	GHz	Table IIIB
RF Output Power, P_{Tmin}	11.5	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at — VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	171	mA	Table IIIB
quency, f_{meas}	54.93971	GHz	Table IIIB
RF Output Power, P_{meas}	11.5	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at — VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	172	mA	Table IIIB
Frequency, f_{meas}	54.93971	GHz	Table IIIB
RF Output Power, P_{meas}	11.5	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at — VDC = Ø MHz
Δf_V at 10.5 VDC or at — VDC = Ø MHz
Δf_T at 10.0 VDC ($= f_{Tmin} - f_{Tnom}$) -.46 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at — VDC = Ø dB
ΔP_V at 10.5 VDC or at — VDC = Ø dB
ΔP_T at 10.0 VDC ($= P_{Tmin} - P_{Tnom}$) = -.7 dB

Accept ✓ Reject ____

t Performed by D. WILLIAMS Date 4/26/99
ıtton Q.A. FSS M/18 Date APR 2 9 1999

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 40 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET — FINAL DATA SET ✓

LITTON TYPE LS E-9036 AU/A — AESD 1336610-
SERIAL NUMBER: 85017 — QUAL TEST — — ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	31	°C	30° ± 1°C
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	177	mA	Table IIIB
Input Power, P_{diss}	1.77	W DC	Pdiss max
Frequency, $f_{30\text{-}C}$	54.94020	GHz	Table IIIB
RF Output Power, $P_{30\text{-}C}$	12.3	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at — VDC			
Temperature	31	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	175	mA	Table IIIB
Frequency, f_{meas}	54.94020	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at — VDC			
Temperature	31	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	175	mA	Table IIIB
Frequency, f_{meas}	54.94020	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30\text{-}C}$:

Δf_V at 9.5 VDC or at — VDC = Ø MHz

Δf_V at 10.5 VDC or at — VDC = Ø MHz

Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$) = +.63 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30\text{-}C}$:

ΔP_V at 9.5 VDC or at — VDC = Ø dB

ΔP_V at 10.5 VDC or at — VDC = Ø dB

ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$) = +.1 dB

Accept ✓ Reject ______

Test Performed by D. Williams — Date 4/26/99

Litton Q.A. FSS M/18 — Date APR 29 1999

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	C	

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET — FINAL DATA SET ✓

LITTON TYPE LS E-9036 AS/A AESD 1336610-7
SERIAL NUMBER: 85017 QUAL TEST — ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	43	°C	Table IIIB
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	177	mA	Table IIIB
Input Power, P_{diss}	1.77	W DC	Pdiss max
Frequency, f_{Tmax}	54.94040	GHz	Table IIIB
RF Output Power, P_{Tmax}	12.2	dBm	11.5 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at — VDC			
Temperature	43	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	175	mA	Table IIIB
Frequency, f_{meas}	54.94040	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	11.5 to 17 dBm

Measurement at 10.5 VDC or at — VDC			
Temperature	43	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	176	mA	Table IIIB
Frequency, f_{meas}	54.94040	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	11.5 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at — VDC = Ø MHz
Δf_V at 10.5 VDC or at — VDC = Ø MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$) = -1.23 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at — VDC = Ø dB
ΔP_V at 10.5 VDC or at — VDC = Ø dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$) = Ø dB

Accept ✓ Reject

Test Performed by D. WILLIAMS Date 4/26/99
Litton Q.A. FSS M18 Date APR 29 1999

LITTON
Solid State

TEST DATA SHEET 7.22A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET — FINAL DATA SET ✓

LITTON TYPE LS 16-9036 AS/A
SERIAL NUMBER: 85017 QUAL TEST —
AESD 1336610-7
ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION			LIMITS
1. Initial Performance at Tnom ± 1°C			
Temperature	23	°C	Tnom ± 1°C
Frequency, f_{Tnom}	54.94027	GHz	Table IIIB
RF Output Power, P_{Tnom}	12.1	dBm	11.5 to 17 dBm
Input Voltage, V_B	10.	VDC	10 ± 0.2 VDC
Input Current, I_B	176.5	mA	Table IIIB
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	.27	MHz	
2. Performance at Tnom ± 1°C after +60°C soak.			
Temperature	23	°C	Tnom ± 1°C
Frequency, f_{meas}	54.94030	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	11.5 to 17 dBm
Input Voltage	10.00	VDC	V_B ± .005 VDC
Input Current	176.9	mA	Table IIIB
3. Performance at Tnom ± 1°C after -30°C soak.			
Temperature	23	°C	Tnom ± 1°C
Frequency, f_{meas}	54.94024	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	11.5 to 17 dBm
Input Voltage	10.00	VDC	V_B ± .005 VDC
Input Current	176.1	mA	Table IIIB

Calculate frequency variation, $\Delta f_H = f_{meas} - f_{Tnom}$:
Δf_H after 60°C soak = + .03 MHz
Δf_H after -30°C soak = - .03 MHz

Calculate RF output power variation, $\Delta P_H = P_{meas} - P_{Tnom}$:
ΔP_H = after 60°C soak = Ø dB
ΔP_H = after -30°C soak = Ø dB

Test Performed by D-WILLIAMS
Litton Q.A. FSS W18
Accept ✓ Reject
Date 4/28/99
Date APR 29 1999

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
56348	A	1300823	C	

LITTON
Solid State

TEST DATA SHEET 7.23A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET —— FINAL DATA SET ✓

LITTON TYPE LS E-9036 AJ/A — AESD 1336610-7
SERIAL NUMBER: 85017 — QUAL TEST —— — ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Initial Measurement. Ref Test Par. 5.9.1			
Temperature	22	°C	24°C ± 5°C
Frequency	54.94015	GHz	Table IIIB
RF Output Power	12.0	dBm	11.5 to 17 dBm
Input Voltage	10.0	VDC	10 ± 0.2 VDC
Input Current	177	mA	Table IIIB
Reference test. Ref. Test Para. 5.9.3			
Frequency, f_{Ref}	~~54.940182~~ 54.94015 DW	GHz	Table IIIB
RF Output Power, P_{Ref}	-12.8	dBm	
Load Pulling Test. Ref. Test Para. 5.9.4			
Maximum Frequency, f_{meas}	54.940182	GHz	Table IIIB
Minimum Frequency, f_{meas}	54.940167	GHz	Table IIIB
Maximum RF Output Power P_{meas}	-12.1	dBm	
Minimum RF Output Power, P_{meas}	-13.0	dBm	

Calculate maximum positive (f_{meas} is greater than f_{Ref}) and negative (f_{meas} is less than f_{Ref}) frequency variation, $\Delta f_L = f_{meas} - f_{Ref}$:

Maximum Positive Δf_L = +.032 ~~Ø~~ DW MHz
Maximum Negative Δf_L = Ø ~~.032~~ DW MHz

Calculate maximum positive (P_{meas} is greater than P_{Ref}) and negative (P_{meas} is less than P_{Ref}) RF Output Power Variation, $\Delta P_L = P_{meas} - P_{Ref}$:

Maximum Positive ΔP_L = +.7 dB
Maximum Negative ΔP_L = -.2 dB

Accept ✓ Reject ______

Test Performed by D. WILLIAMS Date 4/26/99
Litton Q.A. FSS M/18 Date APR 29 1999

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 60 OF 68
56348	A	1300823	C	

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET ——— FINAL DATA SET ✓

LITTON TYPE LS E-9036 A5/A
SERIAL NUMBER: 85017
QUAL TEST ———
AESD 1336610-7
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	22	°C	24°C ± 5°C
Frequency:	54.94013	GHz	Table IIIB
RF Output Power:	12.0	dBm	11.5 to 17 dBm
Input Voltage	10.0	VDC	10 ± 0.2 VDC
Input Current:	177	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	+.332	MHz (Positive)	Table IIIB
	-.03	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	+.23 DW ~~+.46~~	MHz (Positive)	Table IIIB
	-.46	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	+.8	dB (Positive)	1.0 dB
	-.9	dB (Negative)	-1.0 dB

Accept ✓ Reject ______

Test Performed by D. WILLIAMS Date 4/28/99

Litton Q.A. FSS M/18 Date APR 29 1999

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 61 OF 68
56348	A	1300823	C	

Report No. 11491
June 1999

Channel 8 LO

DRO (P/N: 1336610-8, S/N: 85074)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AK/A AESD 1336610- 8
SERIAL NUMBER: 85074 QUAL TEST ✓ ACCEPT TEST N/A

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	189 mA	Table IIIB
Input Power, P_{diss}	1.89 W DC	P_{diss} max
Frequency, f_{Tnom}	55.50036 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.66 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.36 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	187 mA	Table IIIB
Frequency, f_{meas}	55.50036 GHz	Table IIIB
RF Output Power, P_{meas}	12.66 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	188 mA	Table IIIB
Frequency, f_{meas}	55.50036 GHz	Table IIIB
RF Output Power, P_{meas}	12.66 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 ✓ VDC = 0 MHz
Δf_V at 10.5 VDC or at 10.5 ✓ VDC = 0 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 ✓ VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 ✓ VDC = 0 dB

Accept ✓ Reject ______

Test Performed by DHr Date 4-17-98
Litton QA NCL M 60 Date APR 24 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AK/A AESD 1336610- 8
SERIAL NUMBER: 85074 QUAL TEST ✓ ACCEPT TEST N/A

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	11	°C	10° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	189	mA	Table IIIB
Input Power, P_{diss}	1.89	W DC	Pdiss max
Frequency, $f_{10°C}$	55.49932	GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.8	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1
Measurement at 9.5 VDC or at 9.5 VDC

Temperature	11	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	187	mA	Table IIIB
Frequency, f_{meas}	55.49927	GHz	Table IIIB
RF Output Power, P_{meas}	12.8	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC

Temperature	11	°C	Table IIIB
Input Voltage	10	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	187	mA	Table IIIB
Frequency, f_{meas}	55.49927	GHz	Table IIIB
RF Output Power, P_{meas}	12.8	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:
Δf_V at 9.5 VDC or at 9.5 V VDC = -0.05 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = -0.05 MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$) = -.96 8 MH MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:
ΔP_V at 9.5 VDC or at 9.5V VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5V VDC = 0 dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$) = 0.14 dB

Accept ✓ Reject ____

Test Performed by DM Date 4-17-98
Litton Q.A. 53 82 Date APR 2 1 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B3	

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AK/A AESD 1336610- 8
SERIAL NUMBER: 85074 QUAL TEST ✓ ACCEPT TEST N/A

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	-2 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	188 mA	Table IIIB
Input Power, P_{diss}	1.88 W DC	Pdiss max
Frequency, f_{Tmin}	55.49754 GHz	Table IIIB
RF Output Power, P_{Tmin}	12.86 dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2
Measurement at 9.5 VDC or at 9.5 VDC

Temperature	-2 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para 5.2.3.2
Input Current	186 mA	Table IIIB
Frequency, f_{meas}	55.49754 GHz	Table IIIB
RF Output Power, P_{meas}	12.86 dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC

Temperature	-2 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para 5.2.3.3
Input Current	186 mA	Table IIIB
Frequency, f_{meas}	55.49754 GHz	Table IIIB
RF Output Power, P_{meas}	12.86 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:
Δf_V at 9.5 VDC or at 9.5 VDC = 0 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0 MHz
Δf_T at 10.0 VDC ($=f_{Tmin} - f_{Tnom}$) -2.82 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB
ΔP_T at 10.0 VDC ($=P_{Tmin} - P_{Tnom}$) = 0.2 dB

Accept ✓ Reject

Test Performed by Date 4-17-98
Litton Q.A. Date APR 24 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 40 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AK/A — AESD 1336610- 8
SERIAL NUMBER: 85074 — QUAL TEST — ACCEPT TEST —

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30	°C	30° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	190	mA	Table IIIB
Input Power, P_{diss}	1.90	W DC	Pdiss max
Frequency, $f_{30°C}$	55.50109	GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.46	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	30	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	188	mA	Table IIIB
Frequency, f_{meas}	55.50109	GHz	Table IIIB
RF Output Power, P_{meas}	12.46	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	30	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	188	mA	Table IIIB
Frequency, f_{meas}	55.50109	GHz	Table IIIB
RF Output Power, P_{meas}	12.46	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = 0 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0 MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$) = 0.73 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$) = -0.2 dB

Accept ✓ Reject

Test Performed by [initials] Date 4-17-98
Litton Q.A. [stamp] 83 Date APR 24 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A AESD 1336610- 8
SERIAL NUMBER: 85074 QUAL TEST ✓ ACCEPT TEST N/A

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	43 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	191 mA	Table IIIB
Input Power, P_{diss}	1.91 W DC	Pdiss max
Frequency, f_{Tmax}	55.50095 GHz	Table IIIB
RF Output Power, P_{Tmax}	12.26 dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	44 °C	Table IIIB
Input Voltage	~~10~~ 9.5 VDC	9.5 VDC or Para 5.2.3.2
Input Current	189 mA	Table IIIB
Frequency, f_{meas}	55.50094 GHz	Table IIIB
RF Output Power, P_{meas}	12.26 dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	44 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para 5.2.3.3
Input Current	189 mA	Table IIIB
Frequency, f_{meas}	55.50093 GHz	Table IIIB
RF Output Power, P_{meas}	12.26 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:
Δf_V at 9.5 VDC or at 9.5 VDC = -0.01 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = -0.02 MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$) = 0.60 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$) = -0.4 dB

Accept ✓ Reject ______

Test Performed by ______ Date 4-17-98
Litton Q.A. (stamp: LTI NC 8) Date APR 24 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
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LITTON
Solid State

TEST DATA SHEET 7.7
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AK/A AESD 1336610- 8
SERIAL NUMBER: 85074 QUAL TEST ✓ ACCEPT TEST N/A

Power Supply Immunity. Ref. Test Para. 5.2.4

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Initial Measurement		
Temperature	21 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	189 mA	Table IIIB
Input Power	1.89 W DC	Pdiss max
Frequency (f_{Tnom})	55.50010 GHz	Table IIIB
RF Output Power	12.66 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.10 MHz	

Performance After Short Circuit on Power Supply: Ref Test Para 5.2.4.2

Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	189 mA	Table IIIB
Input Power	1.89 W DC	Pdiss max
Frequency	55.50013 GHz	Table IIIB
RF Output Power	12.66 dBm	12 to 17 dBm

Over Voltage: Ref Test Para 5.2.4.3

Overvoltage Input Voltage	28 VDC	+28V

Performance After Input Overvoltage

Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	189 mA	Table IIIB
Input Power	1.89 W DC	Pdiss max
Frequency	55.50015 GHz	Table IIIB
RF Output Power	12.66 dBm	12 to 17 dBm

Reverse Polarity: Ref Test Para 5.2.4.4

Reverse Input Voltage	-10 VDC	-10.0 ± 0.2 VDC

Performance After Reverse Input Voltage

Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	190 mA	Table IIIB
Input Power	1.90 W DC	Pdiss max
Frequency, f_{Tnom}	55.50015 GHz	Table IIIB
RF Output Power	12.66 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.15 MHz	

Accept ✓ Reject

Test Performed by [illegible] Date 4-17-98
Litton Q.A. [stamp] Date APR 24 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 43 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.22A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS F 9036 AK/A — AESD 1336610- 8
SERIAL NUMBER: 85074 — QUAL TEST ✓ — ACCEPT TEST N/A

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION			LIMITS
1. Initial Performance at Tnom ± 1°C			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{Tnom}	55.50018	GHz	Table IIIB
RF Output Power, P_{Tnom}	12.66	dBm	12 to 17 dBm
Input Voltage, V_B	10	VDC	10 ± 0.2 VDC
Input Current, I_B	189	mA	Table IIIB
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.18	MHz	
2. Performance at Tnom ± 1°C after +60°C soak.			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	55.50030	GHz	Table IIIB
RF Output Power, P_{meas}	12.6	dBm	12 to 17 dBm
Input Voltage	10	VDC	V_B ± .005 VDC
Input Current	189	mA	Table IIIB
3. Performance at Tnom ± 1°C after -30°C soak.			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	55.50031	GHz	Table IIIB
RF Output Power, P_{meas}	12.6	dBm	12 to 17 dBm
Input Voltage	10	VDC	V_B ± .005 VDC
Input Current	189	mA	Table IIIB

Calculate frequency variation, $\Delta f_H = f_{meas} - f_{Tnom}$:
Δf_H after 60°C soak = 0.12 MHz
Δf_H after -30°C soak = 0.13 MHz

Calculate RF output power variation, $\Delta P_H = P_{meas} - P_{Tnom}$:
ΔP_H = after 60°C soak = -.06 dB
ΔP_H = after -30°C soak = -.06 dB

Accept ✓ Reject ______
Test Performed by ______ Date 6-20-98
Litton Q.A. ______ Date APR 24 1998

001 LITTON M 60

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.23A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AE/A
SERIAL NUMBER: 85074 QUAL TEST ✓
AESD 1336610- 8
ACCEPT TEST N/A

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Initial Measurement. Ref Test Par. 5.9.1		
Temperature	~~55~~ 22 °C	24°C ± 5°C
Frequency	55.50035 GHz	Table IIIB
RF Output Power	12.8 dBm	12 to 17 dBm
Input Voltage	10 VDC	10 ± 0.2 VDC
Input Current	189 mA	Table IIIB
Reference test. Ref. Test Para. 5.9.3		
Frequency, f_{Ref}	55.50035 GHz	Table IIIB
RF Output Power, P_{Ref}	-13.4 dBm	
Load Pulling Test. Ref. Test Para. 5.9.4		
Maximum Frequency, f_{meas}	55.50040 GHz	Table IIIB
Minimum Frequency, f_{meas}	55.50035 GHz	Table IIIB
Maximum RF Output Power P_{meas}	-13.0 dBm	
Minimum RF Output Power, P_{meas}	-13.7 dBm	

Calculate maximum positive (f_{meas} is greater than f_{Ref}) and negative (f_{meas} is less than f_{Ref}) frequency variation. $\Delta f_L = f_{meas} - f_{Ref}$:

Maximum Positive Δf_L = 0.05 MHz
Maximum Negative Δf_L = 0 MHz

Calculate maximum positive (P_{meas} is greater than P_{Ref}) and negative (P_{meas} is less than P_{Ref}) RF Output Power Variation. $\Delta P_L = P_{meas} - P_{Ref}$:

Maximum Positive ΔP_L = .4 dB
Maximum Negative ΔP_L = -.3 dB

Accept ✓ Reject ____

Test Performed by DH Date 4-20-98
Litton Q.A. LITTON M60 Date APR 24 1998

LITTON
Solid State

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A AESD 1336610- 8
SERIAL NUMBER: 85074 QUAL TEST ✓ ACCEPT TEST N/A

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	22	°C	24°C ± 5°C
Frequency:	5549970	GHz	Table IIIB
RF Output Power:	12.6	dBm	12 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current:	189	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	0.54	MHz (Positive)	Table IIIB
	0	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	0.73	MHz (Positive)	Table IIIB
	−2.87	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0.54	dB (Positive)	1.0 dB
	−0.76	dB (Negative)	-1.0 dB

Accept ✓ Reject ________

Test Performed by DH Date 4-21-98

Litton Q.A. LITTON M 60 Date APR 24 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 61 OF 68
56348	A	1300823	B3	

Report No. 11491
June 1999

Channels 9-14 LOs

PLO No. 1 (P/N: 1348360-4, S/N: F14)

PLO N0. 2 (P/N: 1348360-3, S/N: F01)

Summary of Test Results for AMSU-A Phase Locked Oscillator Testing
Serial Numbers F12 and F14

Paragraph	Description	Requirements	F12	F14
3.2.1.1	Input Voltage and Current	600 mA max, +15V 100 mA max, -15V	506 mA for +15V, 65 mA for -15V	524 mA for +15V, 68 mA for -15V
3.2.1.2	Operating Temperature	+1°C to 44°C	-25°C to +60°C	-30°C to 60°C
3.2.1.3	Start-up	All loads, +60°C and -30°C; in vacuum	Verified at +60 and -30°C, ambient	Verified at +60 and -30°C, ambient
3.2.1.4 & 3.2.1.5	Frequency Stability from 57.290344 GHz	±200 kHz	+21 kHz, -0 kHz	+5 kHz to -17 kHz
3.2.1.6	RF Output Power	17 to 20 dBm	18.5 dBm	19.4 dBm
3.2.1.7	Output Power Stability	<1.5 dB	0.8 dB	0.9 dB
3.2.1.8	Load VSWR	2.01:1 or less	Verified	Verified
3.2.1.9	AM Noise	<-130 dBc/Hz @ 1 MHz	-134 dBc/Hz @ 1MHz	-146 dBc/Hz @ 1Mhz
3.2.1.10	FM Noise	<-100 dBc/Hz @ 1 MHz	-103 dBc/Hz @ 1 MHz	<-109 dBc/Hz @ 1 MHz
3.2.1.11	Spurious and Sub-Harmonic Signals	<-90 dBc	< -92 dBc	< -91dBc
3.2.1.12	Harmonics	<30 dBc	-59 dBc	-50 dBc
3.2.1.14	Warm-up Time	< 30 minutes	Verified	Verified
3.2.1.15	Grounding and Shielding		By Design	By Design
3.2.1.16	Input Voltage Protection		By Design	By Design
3.2.1.17	Reverse Polarity Protection		By Design	By Design
Environmental Testing				
Microphonics		AE-26633	TCXO Test	TCXO Test
Radiation Hardness		AE-26633	By Analysis	By Analysis
EMI/RFI		AE-26633	Not Required	Not Required
Vibration		AE-26633	Acceptance Level	Acceptance Level
Thermal Vacuum		AE-26633	Verified at Ambient Pressure Only	Verified at Ambient Pressure Only
Weight		2.0 lbs	2.0 lbs	2.0 lbs

TEST DATA SHEET 6C (Sheet 1 of 4)
Functional Testing (Paragraph 4.2.1)

Post-Thermal Cycling CPT

Test Setup Verified: ____________
Signature

Paragraph 4.2.1.3, Functional Testing:

Step	Test	Expected	Measured	Pass/ Fail
1	Potential Difference from ± 15 V RTN to:			
	PLO Base Plate	< 1.0 Vac	0.0	Pass
	Spectrum Analyzer	< 1.0 Vac	0.0	Pass
	Frequency Counter Chassis	< 1.0 Vac	0.0	Pass
	Power Meter Chassis	< 1.0 Vac	0.0	Pass
4	Evacuate vacuum chamber and record pressure	$<10^{-2}$ torr	Pressure = ambient torr	*
5	Thermal couple readings	TC1 = 22 ± 2 °C	TC1 = 23.7 °C	Pass
			TC2 = 23.1 °C	N/A
			TC3 = 23.5 °C	N/A
6	DRO L/A	0 to 1V	DRO L/A = 62m V	Pass
	PLO L/A	S/N: F06, F08 = 14.6 ± 0.4V S/N: F07 = 0 to 1V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = 4.5 V	Pass
	Is PLO locked?	Yes	Yes X No ____	Pass
7	PLO Frequency	57.290344 ± .0002 GHz	Freq. = 57.2903417 GHz	Pass
	PLO Power	17 to 20 dBm	P = 19.4 dBm	Pass
8	Input Voltage and Current			
	VM1 Voltage	+15 ± 0.1 V	VM1 = 15.0 V	Pass
	VM2 Voltage	-15 ± 0.1 V	VM2 = -15.0 V	Pass
	IM1 Current	600 mA max.	IM1 = 524 mA	Pass
	IM2 Current	100 mA max.	IM2 = 69 mA	Pass
	DRO L/A Voltage	0 to 1V	DRO L/A = 62m V	Pass
	PLO L/A Voltage	S/N: F06, F07, F08 = 14.6 ± 0.4V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = 4.5 V	Pass
12	RF Output Power and	17 to 20 dBm	P = 19.4 dBm	Pass
	Frequency	57.290344 ± .0002 GHz	Freq. = 57.2903417 GHz	Pass
	Baseplate Temp. (TC1)	TC1 = 22 ±2°C	TC1 = 23.6 °C	Pass

*Record data only if performing test under vacuum

TEST DATA SHEET 6C (Sheet 2 of 4)
Functional Testing (Paragraph 4.2.1)

Post-Thermal Cycling CPT

Paragraph 4.2.1.3 (Cont):

Step	Test	Expected	Measured	Pass/ Fail
13	Frequency vs. Voltage			
	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = 15.20 V	Pass
		-15.2 ± 0.05 V	-Voltage = -15.20 V	Pass
		57.290344 ± .0002 GHz	Freq. = 57.2903418 GHz	Pass
		17 to 20 dBm	P = 19.44 dBm	Pass
14	Frequency vs. Voltage			
	± 15 V Supplies	+14.8 ± 0.05 V	+Voltage = 14.80 V	Pass
		-14.8 ± 0.05 V	-Voltage = -14.90 V	Pass
		57.290344 ± .0002 GHz	Freq. = 57.2903418 GHz	Pass
		17 to 20 dBm	P = 19.44 dBm	Pass
15	Spurious and Sub	-200 to -90 dBc	See Plots - <-96dBc	Pass
16	Power level of 114.58 GHz signal	<-10 dBm	-51 dBm	Pass
17	Load VSWR and Frequency Pulling			
	2:1 mismatch over 1λ	N/A	Worst Case Freq = 7 Hz	N/A
	2:1 mismatch over 1λ	N/A	Worst Case Power = .5 dB Peak	N/A
18	Operating Temperature @ 1°C baseplate	TC1 = 1 ±2°C	TC1 = 0.1	Pass
			TC2 = 0.3	N/A
			TC3 = -0.2	N/A
		0 - 1V	DRO L/A = 47 mV	Pass
		S/N: F06, F07, F08 = 14.6 ± 0.4V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = 4.5 V	Pass
19	Input Voltage and Current			
	VM1 Voltage	+15 ± 0.1 V	VM1 = 15.0 V	Pass
	VM2 Voltage	-15 ± 0.1 V	VM2 = -15.0 V	Pass
	IM1 Current	600 mA max.	IM1 = 510 mA	Pass
	IM2 Current	100 mA max.	IM2 = 66 mA	Pass
	DRO L/A Voltage	0 to 1V	DRO L/A = 47 mV	Pass
	PLO L/A Voltage	S/N: F06, F07, F08 = 14.6 ± 0.4V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = 4.5 V	Pass
	RF Output Power	17 to 20 dBm	Power = 19.7 dBm	Pass
	Frequency	57.290344 ± .0002 GHz	Freq. = 57.2903265 GHz	Pass

TEST DATA SHEET 6C (Sheet 3 of 4)
Functional Testing (Paragraph 4.2.1)

Post-Thermal Cycling CPT

Paragraph 4.2.1.3 (Cont):

Step	Test	Expected	Measured	Pass/ Fail
19 (Cont)	Frequency vs. Voltage			
	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = 15.20 V	Pass
		-15.2 ± 0.05 V	-Voltage = -15.20 V	Pass
		57.290344 ± .0002 GHz	Freq. = 57.2903265 GHz	Pass
		17 to 20 dBm	Power = 19.7 dBm	Pass
	Frequency vs. Voltage			
	± 15 V Supplies	+14.8 ± 0.05 V	+Voltage = 14.80 V	Pass
		-14.8 ± 0.05 V	-Voltage = -14.80 V	Pass
		57.290344 ± .0002 GHz	Freq. = 57.2903265 GHz	Pass
		17 to 20 dBm	Power = 19.7 dBm	Pass
	Spurious and Sub	-200 to -90 dBc	See Plots	Pass
	Power level of 114.58 GHz signal	<-10 dBm	-50 dBm	Pass
	Load VSWR and Frequency Pulling			
	2:1 mismatch over 1λ	N/A	Worst Case Freq = 5 Hz	N/A
	2:1 mismatch over 1λ	N/A	Worst Case Power = .4 dB Peak	N/A
21	Operating Temperature @ +44°C Baseplate	TC1 = 44 ±2°C	TC1 = 44.3 PASS	~~Pass~~
			TC2 = 44.5	N/A
			TC3 = 44.4	N/A
		0 - 1V	DRO L/A = 97 mV	Pass
		S/N: F06, F07, F08 = 14.6 ± 0.4V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = 4.5 V	Pass
22	Input Voltage and Current			
	VM1 Voltage	+15 ± 0.1 V	VM1 = 15.0 V	Pass
	VM2 Voltage	-15 ± 0.1 V	VM2 = -15.0 V	Pass
	IM1 Current	600 mA max.	IM1 = 532 mA	Pass
	IM2 Current	100 mA max.	IM2 = 69 mA	Pass
	DRO L/A Voltage	0 to 1V	DRO L/A = 97 mV	Pass
	PLO L/A Voltage	S/N: F06, F07, F08 = 14.6 ± 0.4V S/N: F05, F09 - F14 = 4.3 to 4.7V	PLO L/A = 4.5 V	Pass
	RF Output Power and	17 to 20 dBm	Power = 18.81 dBm	Pass
	Frequency	57.290344 ± .0002 GHz	Freq. = 57.2903423 GHz	Pass

4/1/99

TEST DATA SHEET 6C (Sheet 4 of 4)
Functional Testing (Paragraph 4.2.1)

Post-Thermal Cycling CPT

Paragraph 4.2.1.3 (Cont):

Step	Test	Expected	Measured	Pass/Fail
22 (Cont)	Frequency vs. Voltage			
	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = 15.20 V	Pass
		-15.2 ± 0.05 V	-Voltage = -15.20 V	Pass
		57.290344 ± .0002 GHz	Freq. = 57.2903423 GHz	Pass
		17 to 20 dBm	Power = 18.8 dBm	Pass
	Frequency vs. Voltage			
	± 15 V Supplies	+14.8 ± 0.05 V	+Voltage = 14.80 V	Pass
		-14.8 ± 0.05 V	-Voltage = -14.80 V	Pass
		57.290344 ± .0002 GHz	Freq. = 57.2903423 GHz	Pass
		17 to 20 dBm	Power = 18.5 dBm	Pass
	Spurious and Sub	-200 to -90 dBc	See plots	Pass
	Power level of 114.58 GHz signal	<-10 dBm	-51 dBm	Pass
	Load VSWR and Frequency Pulling			
	2:1 mismatch over 1λ	N/A	Worst Case Freq = 10 Hz	N/A
	2:1 mismatch over 1λ	N/A	Worst Case Power = .4 dB Pk	N/A

Shop Order No.: 622628

Operation: 0170

Unit Serial No.: F19

Date: 4/16/99

Test Engineer: [signature]

Quality Control: 4/19/99

Govt. Rep.: 4-20-99

TEST DATA SHEET 7 (Sheet 1 of 3)
Temperature Cycling (Paragraph 4.2.2)

Test Setup Verified: ____________
Signature

Temperature Cycle	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6
Frequency 57.290344 GHz ±200 kHz	57.2903369	57.2903432	57.2903432	57.2903441	N/A	N/A
Output Power 17 to 20 dBm	19.22	19.12	19.22	19.38	N/A	N/A
Frequency 57.290344 GHz ±200 kHz	57.2903373	57.2903374	57.2903369			
Output Power 17 to 20 dBm	19.42	19.44	19.40			

QC 237
4/19/99

Shop Order No.: 622628

Operation: 0170

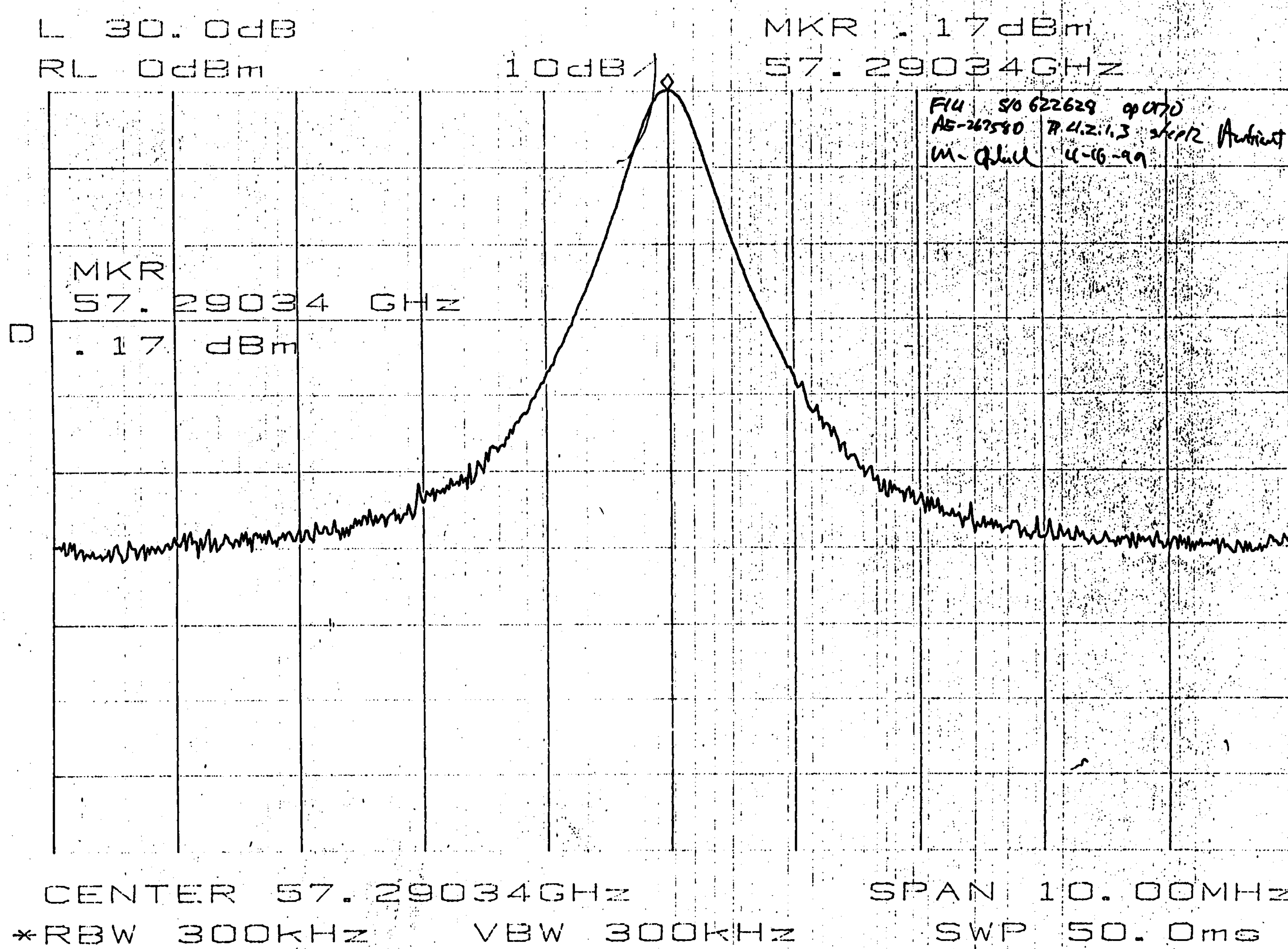
Unit Serial No.: F14

Date: 4/16/99

Test Engineer: ____________

Quality Control: TA 200 4/19/99

Govt. Rep.: 4-20-99


L 30.0dB
RL 0dBm
10dB/
MKR .17dBm
57.29034GHz
FIU S/0 622629 qpC170
AE-262580 P 4.2.1.3 step 2 Ambient
4-16-99
MKR
57.29034 GHz
.17 dBm
D
CENTER 57.29034GHz
SPAN 10.00MHz
*RBW 300kHz
VBW 300kHz
SWP 50.0ms

V-Band PLO Form. .alification Tests

MSO NO: *H/F12D0010* P/N: 857270

S/N: *001*

AE-26660 Reference Paragraph Number	Parameter	Units	Limits Min	Limits Max	Formal Qualification: Full Functional Qual Tests (Amb.)	Post-Vib/Pre-Thermal Vac. (Amb.)	Thermal Vacuum: Thermal Vacuum - Hot Qual	Thermal Vacuum - Cold Qual.	Post Thermal Vacuum	Thermal Qual.: Thermal Qual. - Hot	Thermal Qual. - Cold	Final Functional Qual.
[redacted]					F9	F13	F14	F15	F16	F17	F18	F19
3.2.1.4 - 3.2.1.5.1-4 Oscillator Freq., Freq. Setting, Freq. vs. Temp., Freq. vs. Volt, Freq. Hysteresis	Oscillator Frequency @ Nominal Input Voltage = +15.0, -15.0	GHz	57.290144	57.290544	57.290328	57.290325	57.290326	57.290312	57.290339	57.290324	57.290318	57.290328
	Oscillator Frequency @ Minimum Input Voltage = +14.7, -14.25	GHz	57.290144	57.290544	57.290328					57.290324	57.290318	57.290329
	Oscillator Frequency @ Maximum Input Voltage = +15.3, -15.75	GHz	57.290144	57.290544	57.290328					57.290324	57.290318	57.290329
3.2.1.5 - Frequency Stability	Delta Frequency - Calculate the maximum delta from the nominal output frequency at ambient (22 degrees C)	MHz	-0.2	0.2	N/A					0.015	0.021	0.011
				Test Tech:	114850	115301	87098	114850	114850	114850	114850	114850
				Date:	7/9/98	7/15/98	7/16/98	7/16/98	7/23/98	7/23/98	7/24/98	7/24/98

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AE-26660 Reference Paragraph Number	Parameter	Units	Limits Min	Limits Max	Thermal Vacuum Cycle 2 (Hot)	Cycle 2 (cold)	Cycle 3 (Hot)	Cycle 3 (cold)	Cycle 4 (Hot)	Cycle 4 (cold)	Cycle 5 (Hot)	Cycle 5 (cold)	Cycle 6 (Hot)	Cycle 6 (cold)
3.2.1.3 - Survival & Start-up	+15V Operating Current @ survival temp	mA		860	655.7	696.1	655.0	696.2	654.8	696.1	656.0	696.1	654.8	695.8
	-15V Operating Current @ survival temp.	mA		95	66.7	68.8	66.7	68.8	66.7	68.8	66.7	68.8	66.6	68.9
	Survival & Start-up Temperature	deg. C	NA	NA	58	-30	58	-31	58	-31	58	-30	57	-32
3.2.1.1 and 3.2.1.2 Current	+15V Operating Current @ Qual. temp.	mA		860	675.4	697.0	675.7	696.9	675.7	696.9	675.7	696.9	675.9	696.9
	-15V Operating Current @ Qual temp.	mA		95	66.8	68.1	66.8	68.1	66.8	68.1	66.8	68.1	66.8	68.1
3.2.1.4 - 3.2.1.5.1-4 Oscillator Freq.	Oscillator Frequency @ Nominal Voltage	GHz	57.290 144	57.290 544	57.290 329	57.290 313	57.290 329	57.290 314	57.290 330	57.290 315	57.290 331	57.290 317	57.290 331	57.290 316
3.2.1.6 - RF Output Power	Corrected RF Output Power @ Nominal Input Voltage.	dBm	17	20.7	19.11	20.23	19.08	20.22	19.07	20.21	19.05	20.19	19.06	20.20
			Test Tech:		114850	114850	114850	114850	114850	114850	114850	114850	114850	114850
			Date:		7/17/98	7/17/98	7/18/98	7/18/98	7/18/98	7/19/98	7/19/98	7/20/98	7/20/98	7/20/98

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Report No. 11491
June 1999

Channel 15 LO

GDO (P/N: 1336610-10, S/N: FM2)

AMSU-A GDO Data Sheet 1

Sequence Description: Comprehensive Test 20.5° Date: 4-8-99
Millitech Part Number 9050160001; Serial Number FM2 Operator: JP
Aerojet Part Number 1336610-10 QC Verify Set-up: MTC A4 QA

A. Output Power direct: 15.78 dBm; Output Power in test set-up: 13.34 dBm
Output Power Delta: 2.34 dB

B. Unit Temperature: 20.5 °C; Vacuum level: 15 mTorr

C. Baseline Measurements

Vb (volts)	15.0	14.25	15.75	min limit	max limit	Pass/Fail
Vb meas. (Volts)	15.0	14.26	15.76	-.05	+.05	P
Ib (mA)	156	156	156	--	230	P
fo (GHz)	84.008	84.008	84.008	--	--	
Po (dBm, meas)	13.55	13.53	13.53			
Po (dBm, corr)	15.94	15.92	15.92	13	17	P

D. Frequency Pulling, Vb = 15.0 volts; measured 15.0 V

Fref (GHz)	84.008			min limit	max limit	Pass/Fail
Fmax (GHz)	84.008	+Δ (MHz)	0	--	+ 5 MHz	P
Fmin (GHz)	84.008	- Δ (MHz)	0	-5 MHz	--	P

E. Power Pulling

Pref (dBm)	-6.44			min limit	max limit	Pass/Fail
Pmax (dBm)	-6.54	+Δ (dB)	0.10	--	+0.2dB	P
Pmin (dBm)	-6.34	- Δ (dB)	-0.10	-0.2 dB	--	P

F. Turn-on current

Vb (volts)	15.0	min limit	max limit	Pass/Fail
Measured Vb	N/A	—	—	N/A
Turn-on current (mA)	N/A	--	345	N/A
time to peak (ms)	N/A			
time to settle (ms)	N/A			

G. Unit Temperature: 20.5 °C Vacuum level: 15 mTorr

DATA SHEET ACCEPT/REJECT

Accept	MTC A4 QA	*Reject*	
		Test Failure Report No.	
		Report Date	

SIZE	CAGE CODE	DWG. NO.	
A	8V456	TP501600-2	
SCALE	REV. LTR. A00		SHEET 29 OF 41

AMSU-A GDO Data Sheet 1

Sequence Description: Comprehensive Test -2°C Date: 4-14-99
Millitech Part Number 9050160001; Serial Number FM2 Operator: TP
Aerojet Part Number 1336610-10 QC Verify Set-up:

A. Output Power direct: 15.78 dBm; Output Power in test set-up: 13.34 dBm
Output Power Delta: 2.34 dB

B. Unit Temperature: -1.3 °C; Vacuum level: 15 mTorr

C. Baseline Measurements

Vb (volts)	15.0	14.25	15.75	min limit	max limit	Pass/Fail
Vb meas. (Volts)	15.0	14.25	15.75	-.05	+.05	P
Ib (mA)	151	151	151	--	230	P
fo (GHz)	84.015	84.015	84.015	--	--	
Po (dBm, meas)	13.69	13.69	13.69			
Po (dBm, corr)	16.08	16.08	16.08	13	17	P

D. Frequency Pulling, Vb = 15.0 volts; measured 15.0 V

Fref (GHz)	84.016			min limit	max limit	Pass/Fail
Fmax (GHz)	84.019	+Δ (MHz)	3	--	+ 5 MHz	P
Fmin (GHz)	84.014	- Δ (MHz)	2	-5 MHz	--	P

E. Power Pulling

Pref (dBm)	-6.15			min limit	max limit	Pass/Fail
Pmax (dBm)	-6.35	+Δ (dB)	+0.20	--	+0.2dB	P
Pmin (dBm)	-5.94	- Δ (dB)	0.19	-0.2 dB	--	P

F. Turn-on current

Vb (volts)	15.0	min limit	max limit	Pass/Fail
Measured Vb	N/A	–	–	N/A
Turn-on current (mA)	N/A	--	345	N/A
time to peak (ms)	N/A			
time to settle (ms)	N/A			

G. Unit Temperature: -2.0 °C Vacuum level: 20 mTorr

DATA SHEET ACCEPT/REJECT

Accept	MTC	Reject	
		Test Failure Report No.	
		Report Date	

SIZE	CAGE CODE	DWG. NO.	
A	8V456	TP501600-2	
SCALE	REV. LTR.	A00	SHEET 29 OF 41

AMSU-A GDO Data Sheet 1

Sequence Description: Comprehensive Test +43°C Date: 4-14-99
Millitech Part Number 9050160001; Serial Number EM2 Operator: JP
Aerojet Part Number 1336610-10 QC Verify Set-up: MTC A4 QA

A. Output Power direct: 15.78 dBm; Output Power in test set-up: 13.34 dBm
Output Power Delta: 2.34 dB

B. Unit Temperature: 43.6 °C; Vacuum level: 20 mTorr

C. Baseline Measurements

Vb (volts)	15.0	14.25	15.75	min limit	max limit	Pass/Fail
Vb meas. (Volts)	15.0	14.25	15.74	-.05	+.05	P
Ib (mA)	161	161	161	--	230	P
fo (GHz)	88.997	88.997	88.997	--	--	
Po (dBm, meas)	13.06	13.06	13.06			
Po (dBm, corr)	15.45	15.45	15.45	13	17	P

D. Frequency Pulling, Vb = 15.0 volts; measured 15.0 V

Fref (GHz)	88.997			min limit	max limit	Pass/Fail
Fmax (GHz)	89.000	+Δ (MHz)	3	--	+ 5 MHz	P
Fmin (GHz)	88.995	- Δ (MHz)	2	-5 MHz	--	P

E. Power Pulling

Pref (dBm)	-6.72			min limit	max limit	Pass/Fail
Pmax (dBm)	-6.62	+Δ (dB)	+0.10	--	+0.2dB	P
Pmin (dBm)	-6.82	- Δ (dB)	-.10	-0.2 dB	--	P

F. Turn-on current

Vb (volts)	15.0	min limit	max limit	Pass/Fail
Measured Vb	N/A	–	–	N/A
Turn-on current (mA)	N/A	--	345	N/A
time to peak (ms)	N/A			
time to settle (ms)	N/A			

G. Unit Temperature: 43.4 °C Vacuum level: 20 mTorr

DATA SHEET ACCEPT/REJECT

Accept	MTC A4 QA	*Reject*	
		Test Failure Report No.	
		Report Date	

SIZE	CAGE CODE	DWG. NO.	
A	8V456	TP501600-2	
SCALE	REV. LTR. A00		SHEET 29 OF 41

AMSU-A GDO Data Calculation Sheet 8

Sequence Description: Frequency Accuracy & Stability Calculations Date: 4-15-99
Millitech Part Number 9050160001; Serial Number FM2 Operator: JP
Aerojet Part Number 1336610-10

A. Frequency Accuracy from Thermal Vacuum, CPT and Final LPT Data

	Parameter, Vb=15.0 volts	Data Sheet, Section	Date, mm/dd/yy	Measurement
1	+Δ, pulling, +20.5°C, MHz	1, D	4-8-99	0
2	- Δ, pulling, + 20.5°C, MHz	1, D	4-8-99	0
3	+Δ,pulling, +43°C	1, D	4-14-99	3
4	-Δ, pulling, +43°C	1, D	4-14-99	-2
5	+Δ, pulling, -2°C	1, D	4-14-99	3
6	-Δ, pulling, -2°C	1, D	4-14-99	-2
7	Set point w / max Hysteresis, GHz	6, E	3-3-99	89.008
8	Set point w / min Hysteresis, GHz	6, E	3-3-99	89.006
9	(Maximum of lines 1, 3, and 5) +7	89.011		GHz
10	(Maximum of lines 2, 4, and 6) +8	89.004		GHz

B. Frequency Accuracy Result

	Result	min limit	max limit	Pass/Fail
A9, GHz	89.011	--	89.030	P
A10, GHz	89.004	88.970	--	P

CONTINUED, GO TO NEXT PAGE

AMSU-A GDO Data Calculation Sheet 8, continued

Sequence Description: Frequency Accuracy & Stability Calculations Date: 4-15-99
Millitech Part Number 9050160001; Serial Number FM2 Operator: JP
Aerojet Part Number 1336610-10

C. Frequency Stability from Comprehensive Performance Test Data

	Bias Voltage, volts	Data Sheet, Section	Date, mm/dd/yy	Tcase, °C	Measurement, GHz
1	14.25	1, C	4-8-99	+20.5	89.008
2	15.0	1, C	"	+20.5	89.008
3	15.75	1, C	"	+20.5	89.008
4	14.25	1, C	4-14-99	-2	89.015
5	15.0	1, C	"	-2	89.015
6	15.75	1, C	"	-2	89.015
7	14.25	1, C	"	+43	88.997
8	15.0	1, C	"	+43	88.997
9	15.75	1, C	"	+43	88.997
10	((Maximum of 1 through 9) -C2)	* 1000 MHz			7 MHz
11	((Minimum of 1 through 9) -C2)	* 1000 MHz			-11 MHz

D. Frequency Stability Result

	Result	min limit	max limit	Pass/Fail
C10, MHz	7	--	+50	P
C11, MHz	-11	-50	--	P

DATA SHEET ACCEPT/REJECT

Accept	MTC AN QA	*Reject*	
		Test Failure Report No.	
		Report Date	

SIZE	CAGE CODE	DWG. NO.	SHEET
A	8V456	TP501600-2	
SCALE		REV. LTR. A00	37 OF 41

FREQUENCY STABILITY OF SAW FILTERS

Channel No.	11	12	13	14
Specification (+/-MHz)	0.9	0.9	0.2	0.2
Short-Term Measured (MHz)	+0.734, -0.441	+0.204, -0.226	+0.019, -0.058	+0.088, -0.00
Long-Term By Analysis (+/-MHz)	+0.02	+0.02	+0.02	+0.02
Total	+0.754, -0.441	+0.224, -0.226	+0.039, -0.058	+0.108, -0.00

Note: Additional +/-0.1 MHz frequency stability reserved for safety margin for channels 11-14.

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REFER TO TEST DATA OF SAW FILTERS PREPARED

IN THE SECTION OF BANDPASS CHARACTERISTICS

Report No. 11491
June 1999

BANDPASS CHARACTERISTICS

FOR

IF FILTERS AND SAW FILTERS

3 dB BANDWIDTH OF IF FILTERS

Channel No.	3	4	5	6	7	8	9	10	15
Specification (MHz)									
3 dB bandwidth (MHz) *	90	200	170	200	200	165	165	78	6000
	82	192	170	192	192	157	157	78	1020
f_L - f_H (MHz)	8-90	8-200	30-200	8-200	8-200	8-165	8-165	178-256	490-1510
Measured (MHz)									
3 dB bandwidth (MHz)	80.10	190.04	167.48	190.18	190.09	154.88	155.04	76.33	996.90
f_L - f_H (MHz)	8.90-89.00	9.12-199.16	31.38-198.86	9.15-199.33	9.10-199.19	9.14-164.02	9.11-164.15	179.01-255.34	492.08-1488.98

* Actual specifications for IF filters.

3 dB BANDWIDTH FOR SAW FILTERS

Channel No.	11	12	13	14
<u>Specification</u>				
3 dB Bandwidth (MHz)	72	32	16	6
f_{L1} - f_{H1} (MHz)	256.2-292.2	292.2-308.2	308.2-316.2	316.2-319.2
f_{L2} - f_{H2} (MHz)	352.2-388.2	336.2-352.2	328.2-336.2	325.2-328.2
<u>Measured</u>				
3 dB Bandwidth (MHz)	70.226	30.928	15.707	5.874
f_{L1} - f_{H1} (MHz)	256.806-291.663	292.552-307.980	308.288-316.135	316.321-319.254
f_{L2} - f_{H2} (MHz)	352.663-388.032	336.329-351.829	328.226-336.086	325.312-328.254

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June 1999

Channel 3 Bandpass Filter

IF Filter (S/N: 1331559-3, S/N: P229-011)

APPENDIX C

ACCEPTANCE TEST REPORT

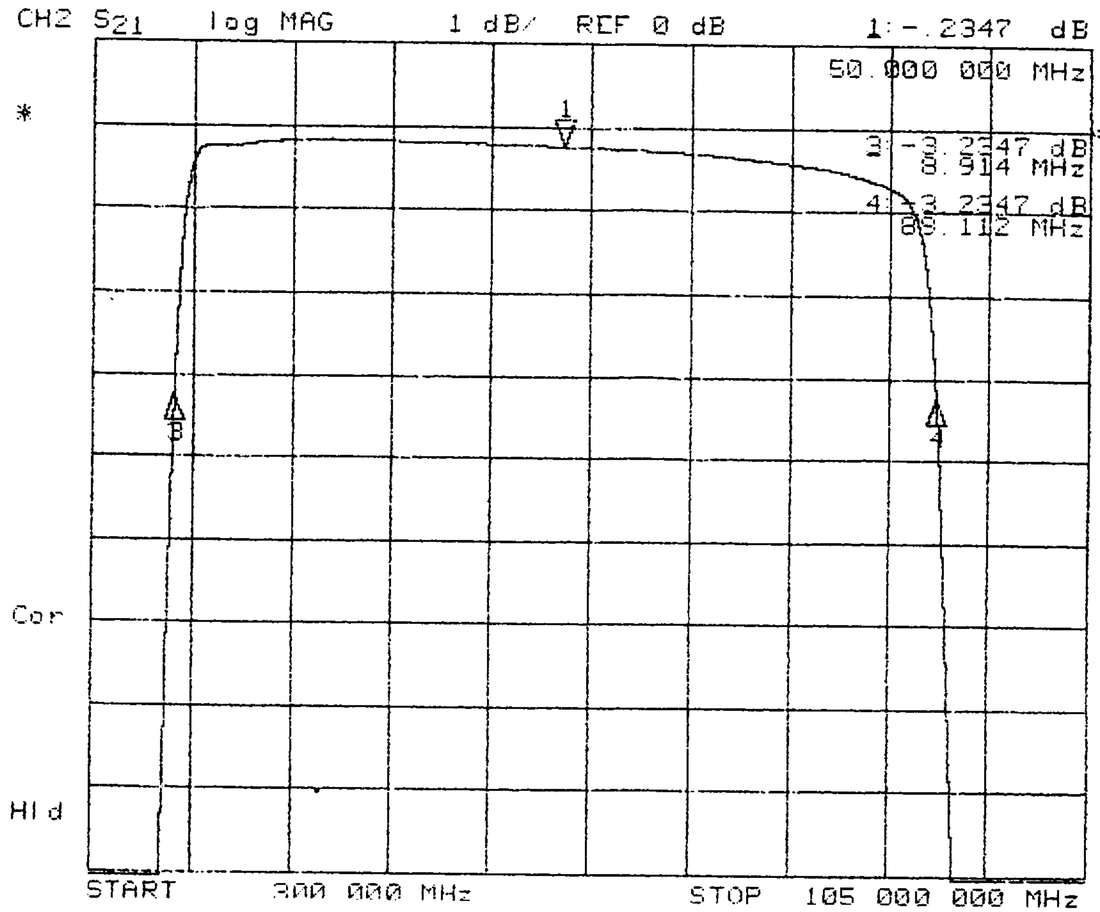
BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-011
AEROJET 1331559-3 REV. E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	89.11 MHz (88.0-90.0)	89.00 Mhz (88.0-90.0)	88.88 MHz (88.0-90.0)
{8} LOWER 3.0 dB BANDEDGE	8.91 MHz (8.0-10.0)	8.90 Mhz (8.0-10.0)	8.89 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	80.20 MHz (78.0-82.0)	80.10 Mhz (78.0-82.0)	79.99 MHz (78.0-82.0)
{10} ADD {7} AND {8} ÷ 2 =	49.01 MHz (50.0 NOM)	48.95 MHz (50.0 NOM)	48.89 Mhz (50.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.4 °C (-15.0 TO -10.0)	+16.3 °C (12.5 TO 17.5)	+43.3 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

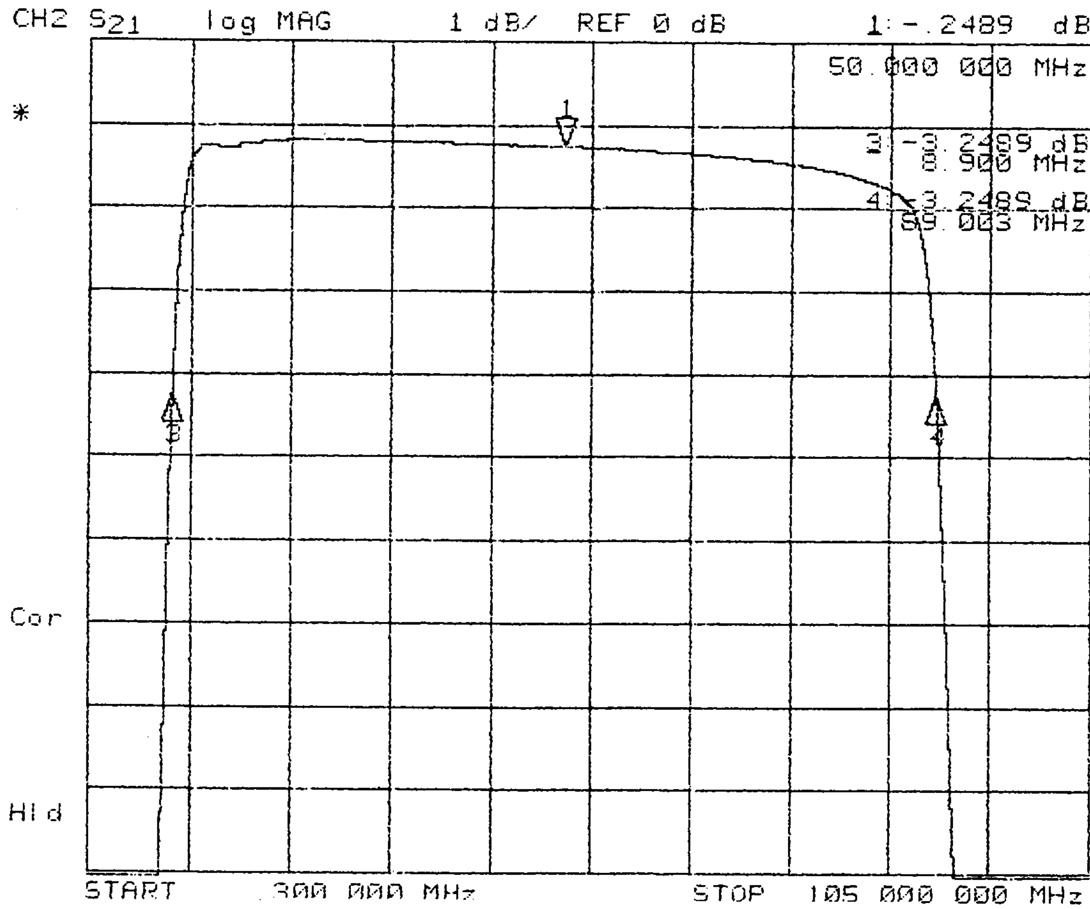
PASSBAND RIPPLE

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	23.86 MHz	23.86 Mhz	23.86 MHz
MIN INSERTION LOSS PERFORMANCE	-0.16 dB	-0.17 dB	-0.17 dB
{11b} 75% BW LOWER BANDEDGE FREQ	10.99 MHz	10.87 Mhz	10.80 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.39 dB	-0.41 dB	-0.43 dB
{11c} 75% BW UPPER BANDEDGE FREQ	70.99 MHz	70.87 Mhz	70.80 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.39 dB	-0.41 dB	-0.43 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.23 dB	0.24 dB	0.26 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.23 dB	0.24 dB	0.26 dB



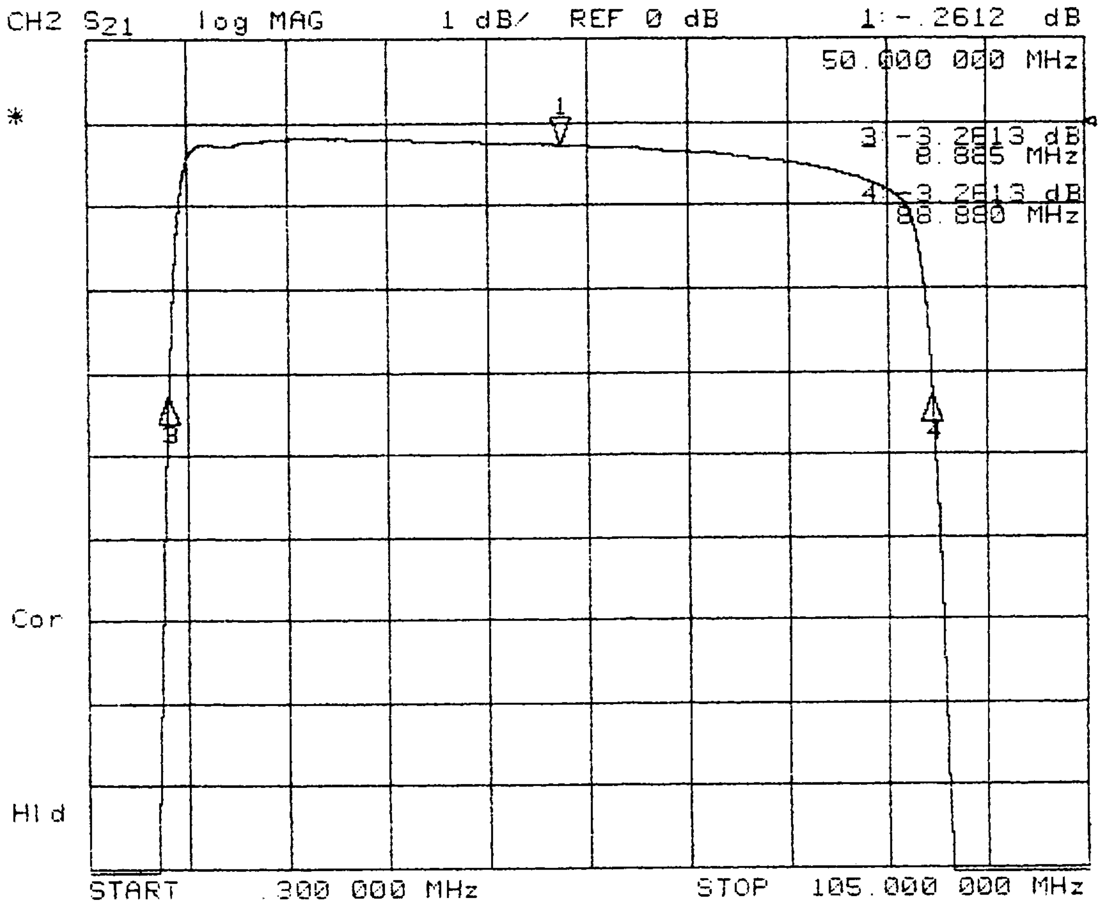
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P229-011
-10C DATA
OPR: R. HOGGATT DATE DEC 1 8 1996

MARKER PARAME...	...hannel 1	...hannel 2
MARKER 1	14.000000 MHz OFF	50.000000 MHz -.2347 dB
MARKER 2	86.000000 MHz OFF	49.013252 MHz OFF
MARKER 3	20.000000 MHz OFF	8.914066 MHz -3.2347 dB
MARKER 4	80.000000 MHz OFF	89.112439 MHz -3.2347 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P229-011
+15C DATA
OPR: R. HOGGATT DATE DEC 1 8 1996

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	14.000000 MHz OFF	50.000000 MHz -.2489 dB
MARKER 2	66.000000 MHz OFF	48.951901 MHz OFF
MARKER 3	20.000000 MHz OFF	8.900751 MHz -3.2489 dB
MARKER 4	80.000000 MHz OFF	89.003052 MHz -3.2489 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P229-011
+40C DATA
OPR: R. HOGGATT DATE DEC 1 8 1996

MARKER PARAME	Channel 1	Channel 2
MARKER 1	14.000000 MHz OFF	50.000000 MHz -.2612 dB
MARKER 2	86.000000 MHz OFF	48.883037 MHz OFF
MARKER 3	20.000000 MHz OFF	8.885575 MHz -3.2613 dB
MARKER 4	80.000000 MHz OFF	88.880499 MHz -3.2613 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-011
AEROJET 1331559-3 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	PASS/FAIL	PASS/FAIL	PASS/FAIL
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.5.5
Fc=50.0 MHz.
REF {5A} FOR INSERTION LOSS @ Fc

	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	>100 dB (40.0 dB MIN)	>100 dB (40.0 dB MIN)	>100 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 102.0 MHz TO 1000.0 MHz	-57.2 dB (40.0 dB MIN)	-58.1 dB (40.0 dB MIN)	-59.0 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-12.4 °C (-15.0 TO -10.0)	+16.2 °C (12.5 TO 17.5)	+43.3 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

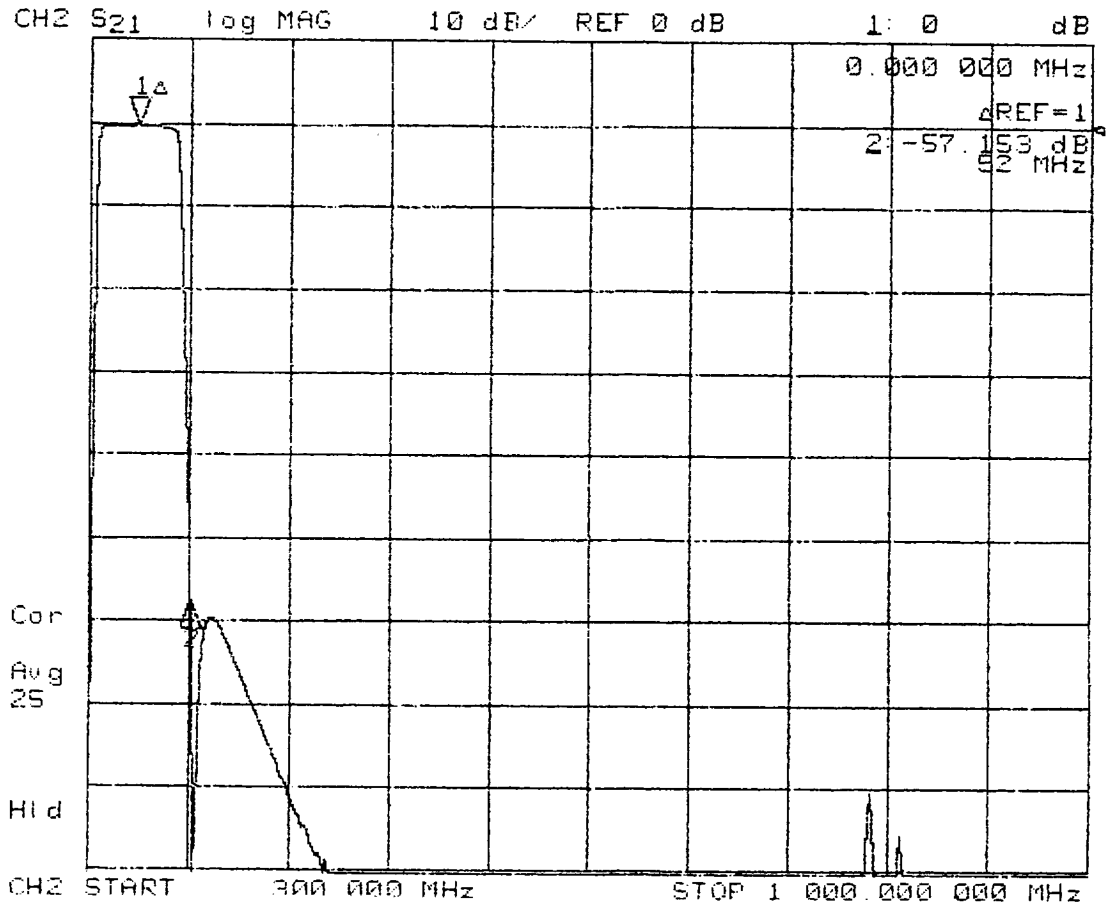
TEST PERFORMED BY R. Hoggatt DATE 12/18/96

NOTE IF TEST WITNESSED BY AESD: Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

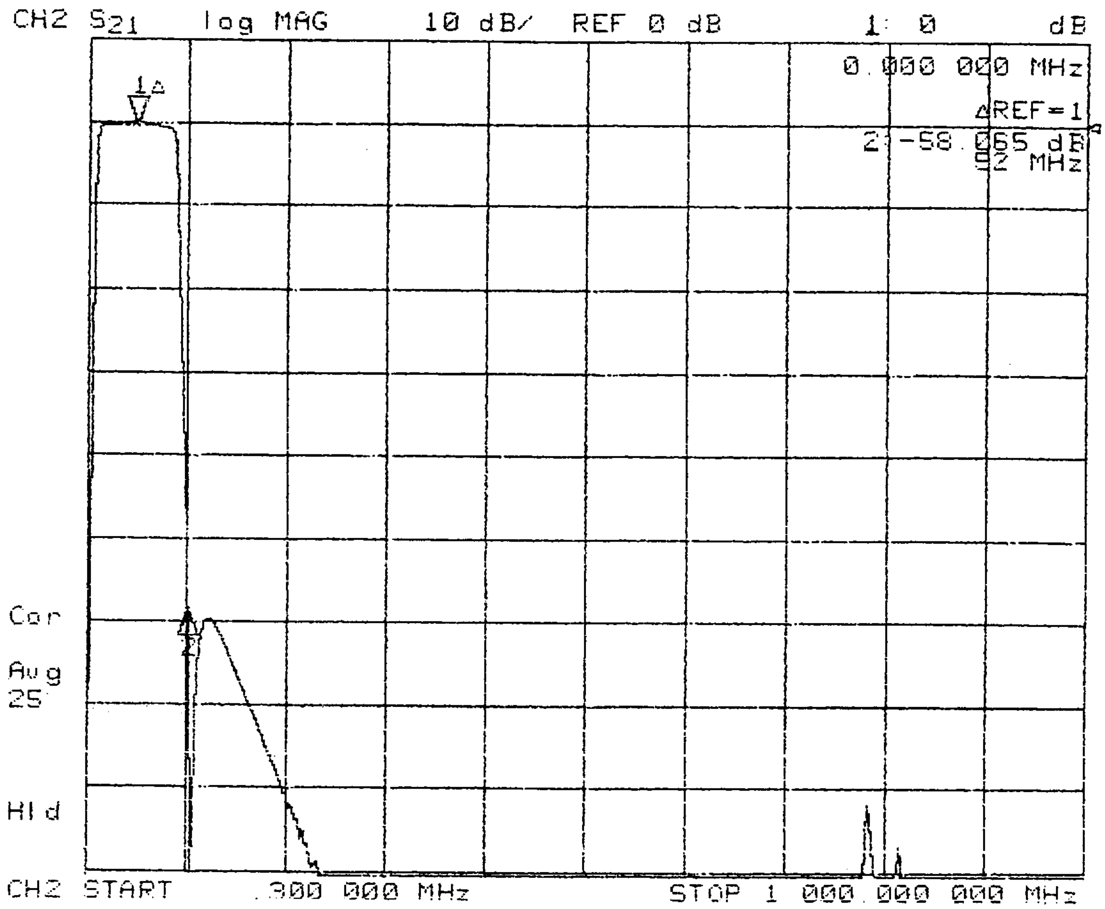
OUTLINE AND MOUNTING DIMENSIONS VERIFICATION
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.501
MOUNTING HOLE CENTER	0.125 ± .010	0.126
BETWEEN UPPER MOUNTING HOLES	$\boxed{3.250}$	3.248
BETWEEN LOWER MOUNTING HOLES	$\boxed{3.250}$	3.250



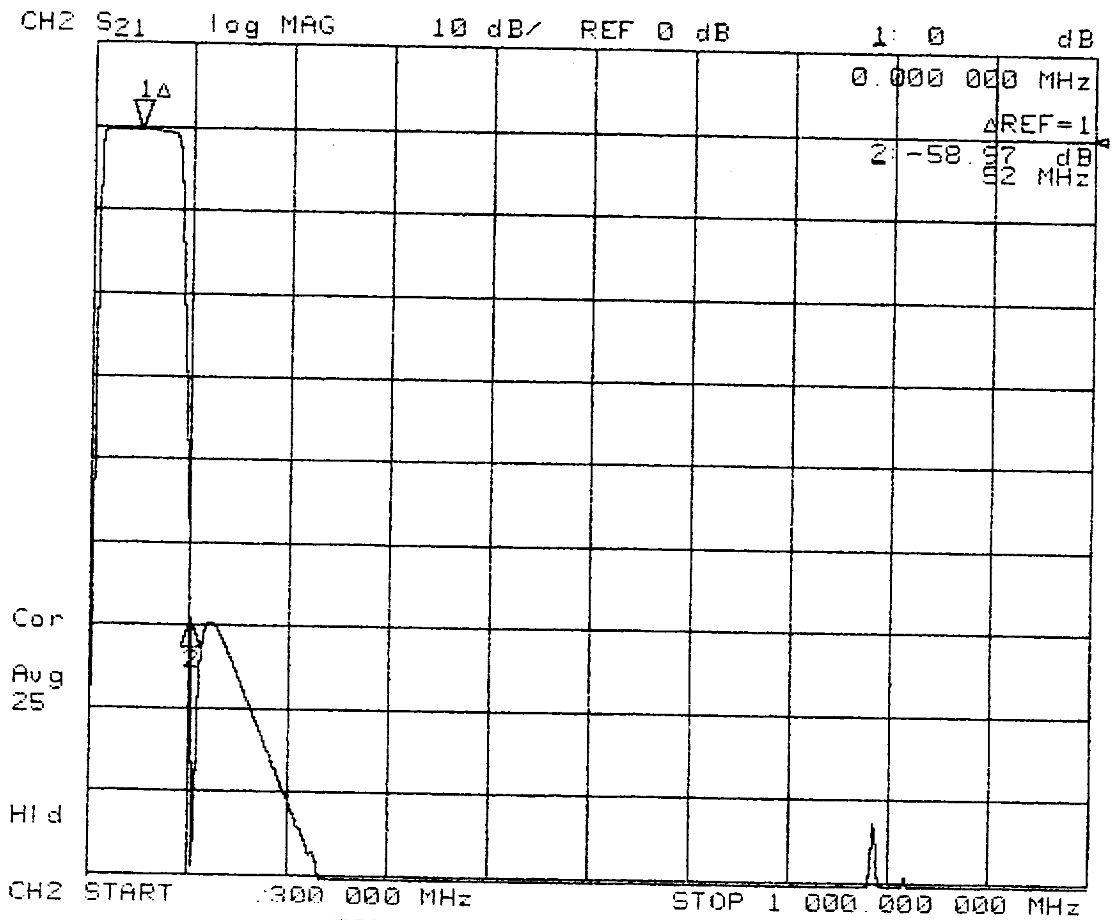
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P229-011
-10C DATA
OPR: R. HOGGATT DATE DEC 1 8 1996

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	50.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	102.000000 MHz -57.153 dB
MARKER 3	5.000000 MHz OFF	102.000000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P229-011
+15C DATA
OPR: R. HOGGATT DATE DEC 1 8 1996

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	50.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	102.000000 MHz -58.065 dB
MARKER 3	5.000000 MHz OFF	102.000000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P229-011
+40C DATA
OPR: R. HOGGATT DATE DEC 1 8 1996

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	50.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	102.000000 MHz -58.97 dB
MARKER 3	5.000000 MHz OFF	119.694690 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-011
AEROJET 1331559-3 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.2 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-106.6 dB	F11	(*) 60.0	MHz	-0.31 dB
F2	1.0	MHz	-96.3 dB	F12	(*) 70.0	MHz	-0.40 dB
F3	5.0	MHz	-31.0 dB	F13	80.0	MHz	-0.64 dB
F4	7.5	MHz	-10.3 dB	F14	85.0	MHz	-0.85 dB
F5	10.0	MHz	-1.34 dB	F15	90.0	MHz	-6.02 dB
F6	15.0	MHz	-0.27 dB	F16	100.0	MHz	-46.6 dB
F7	20.0	MHz	-0.19 dB	F17	200.0	MHz	-81.0 dB
F8	(*) 30.0	MHz	-0.18 dB	F18	300.0	MHz	-102.9 dB
F9	(*) 40.0	MHz	-0.23 dB	F19	500.0	MHz	-99.9 dB
F10	50.0	MHz	-0.25 dB	F20	1000.0	MHz	-101.7 dB

TEST PERFORMED BY: R. HOGGAT DA 5 DATE 12/18/96

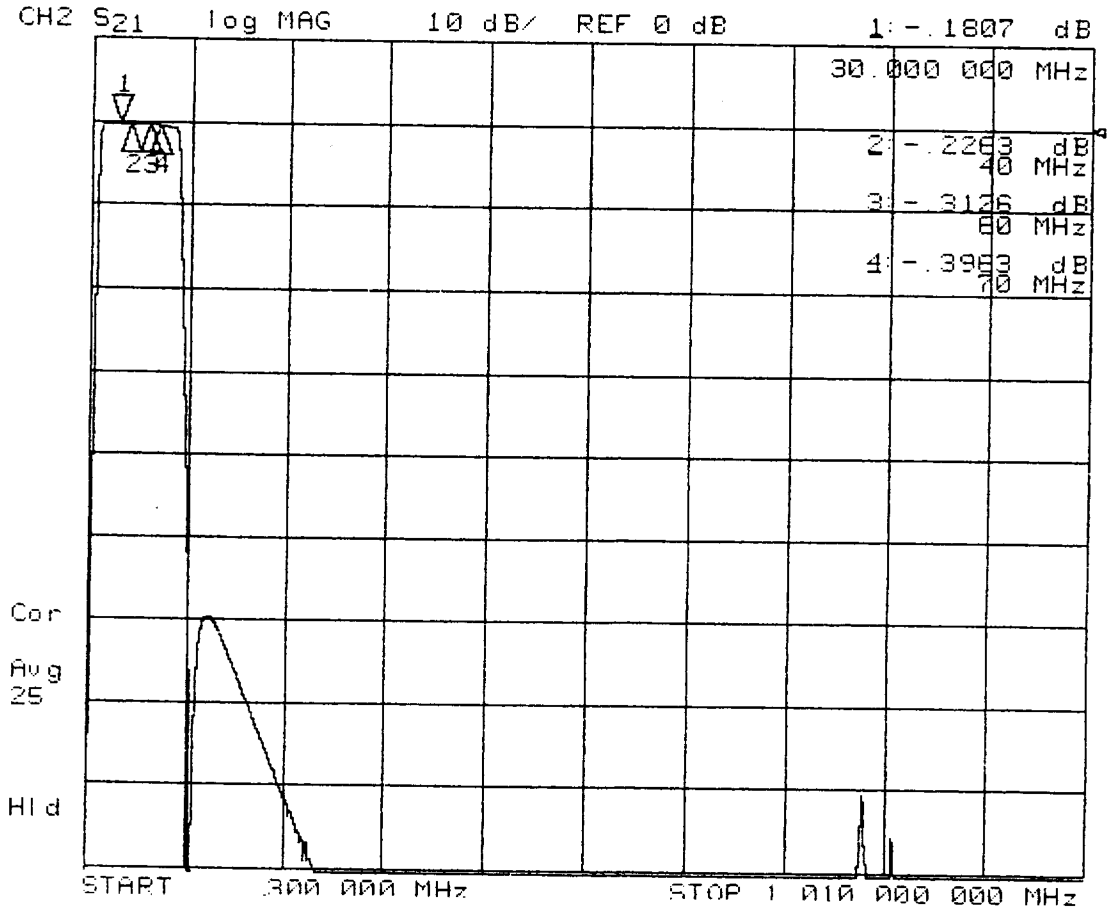
NOTE IF TEST WITNESSED BY AESD. Not witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX C PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P229-011
AMBIENT
OPR: R. HOGGATT DATE DEC 18 1996

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	30.000000 MHz OFF	30.000000 MHz -.1807 dB
MARKER 2	40.000000 MHz OFF	40.000000 MHz -.2263 dB
MARKER 3	60.000000 MHz OFF	60.000000 MHz -.3126 dB
MARKER 4	70.000000 MHz OFF	70.000000 MHz -.3963 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

Report No. 11491
June 1999

Channel 4 Bandpass Filter

IF Filter (S/N: 1331559-2, S/N: P228-022)

APPENDIX B **ACCEPTANCE TEST REPORT**

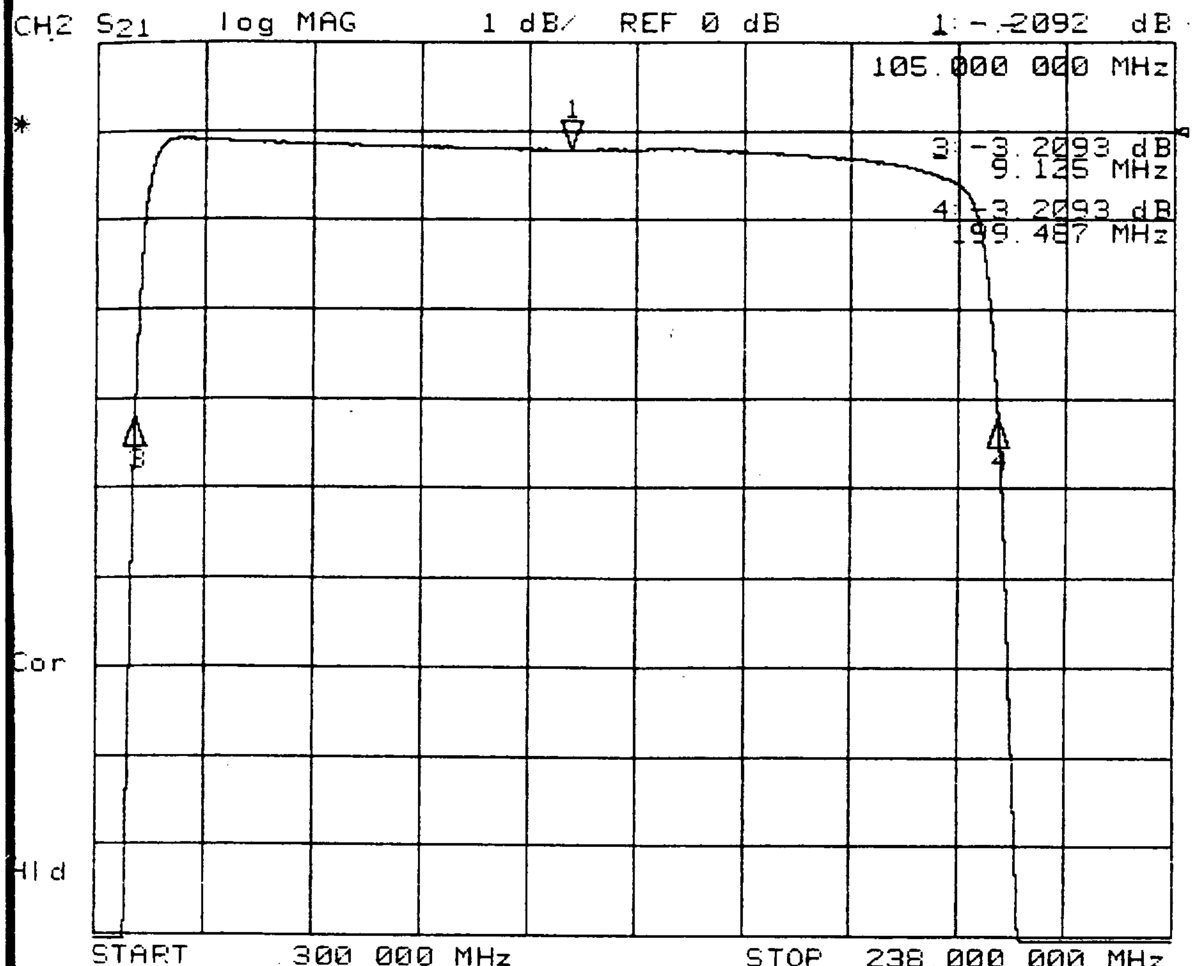
BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-022
AEROJET 1331559-2 REV. E

3.0 dB BANDWIDTH
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.5.3

	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	199.49 MHz (198.0-200.0)	199.16 Mhz (198.0-200.0)	198.83 MHz (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	9.13 MHz (8.0-10.0)	9.12 Mhz (8.0-10.0)	9.11 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	190.36 MHz (188.0-192.0)	190.04 Mhz (188.0-192.0)	189.72 MHz (188.0-192.0)
{10} ADD {7} AND {8} ÷ 2 =	104.31 MHz (105.0 NOM)	104.14 MHz (105.0 NOM)	103.97 Mhz (105.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.5 °C (-15.0 TO -10.0)	+15.1 °C (12.5 TO 17.5)	+43.0 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

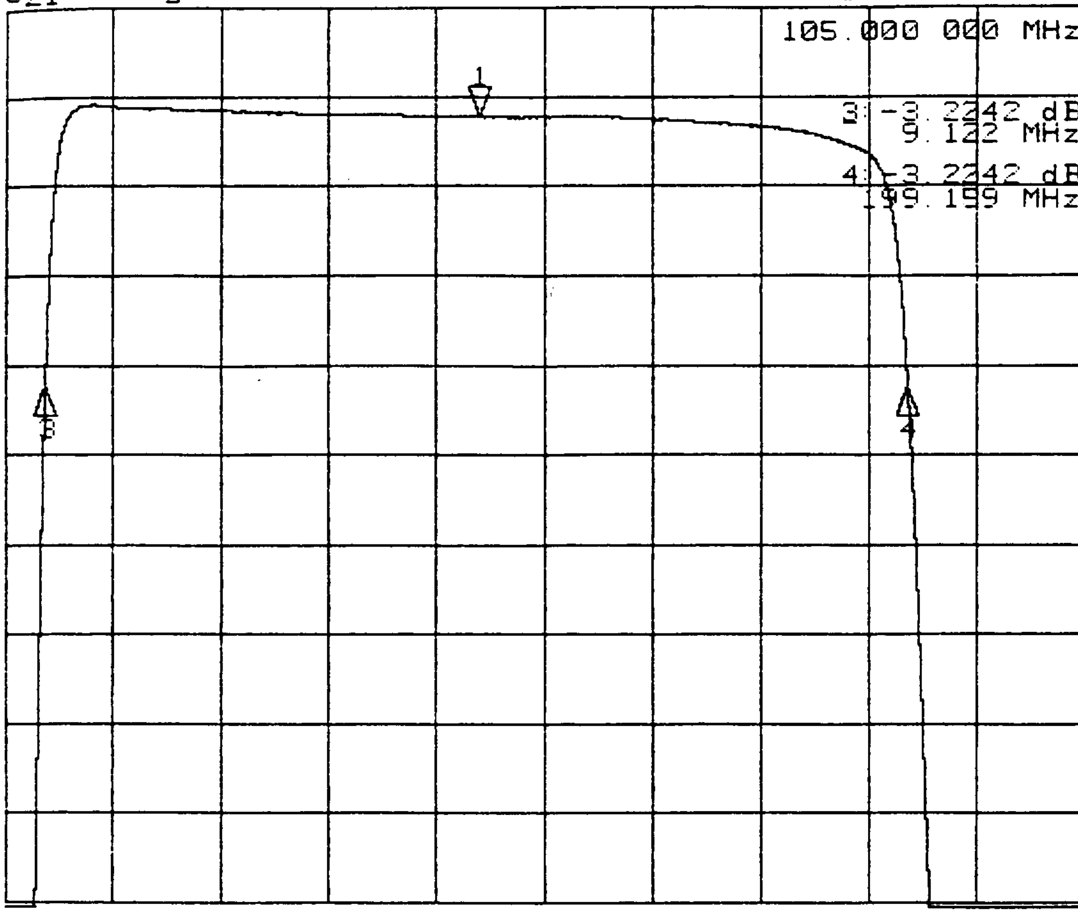
PASSBAND RIPPLE
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.5.4

	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	18.72 MHz	19.91 Mhz	20.50 MHz
MIN INSERTION LOSS PERFORMANCE	-0.08 dB	-0.08 dB	-0.08 dB
{11b} 75% BW LOWER BANDEDGE FREQ	13.77 MHz	13.70 Mhz	13.57 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.27 dB	-0.29 dB	-0.30 dB
{11c} 75% BW UPPER BANDEDGE FREQ	156.27 MHz	156.20 Mhz	156.07 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.27 dB	-0.29 dB	-0.30 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.19 dB	0.21 dB	0.22 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.19 dB	0.21 dB	0.22 dB



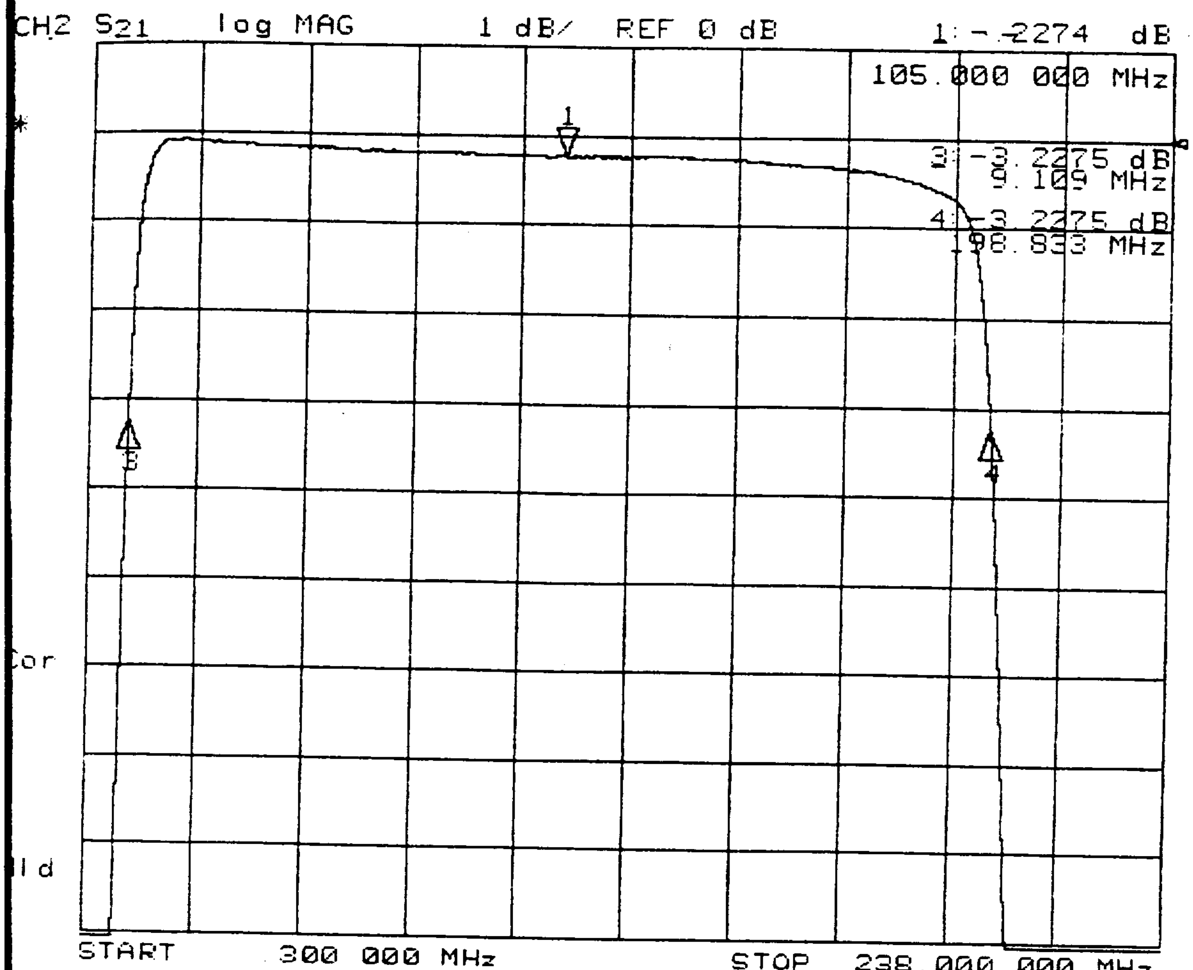
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-022
-10C DATA
OPR: R. HOGGATT DATE DEC 3 0 1996

IARKER PARAMET		annel 2
IARKER 1	19.500000 MHz OFF	105.000000 MHz -.2092 dB
IARKER 2	190.500000 MHz OFF	104.306645 MHz OFF
IARKER 3	33.750000 MHz OFF	9.125411 MHz -3.2093 dB
IARKER 4	176.250000 MHz OFF	199.487879 MHz -3.2093 dB
IKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-022
+15C DATA
OPR: R. HOGGATT DATE DEC 30 1996

MARKER PARAMET		annel 2
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.2241 dB
MARKER 2	190.500000 MHz OFF	104.141138 MHz OFF
MARKER 3	33.750000 MHz OFF	9.122618 MHz -3.2242 dB
MARKER 4	176.250000 MHz OFF	199.159658 MHz -3.2242 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-022
+40C DATA
OPR: R. HOGGATT DATE [illegible]

ARKER PARAMET		annel 2
ARKER 1	19.500000 MHz OFF	105.000000 MHz -.2274 dB
ARKER 2	190.500000 MHz OFF	103.971635 MHz OFF
ARKER 3	33.750000 MHz OFF	9.109777 MHz -3.2275 dB
ARKER 4	176.250000 MHz OFF	198.833494 MHz -3.2275 dB
KR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
ARKER TRACKING	OFF	OFF

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-022
AEROJET 1331559-2 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	PASS/FAIL	PASS/FAIL	PASS/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=105.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-59.2 dB (40.0 dB MIN)	-59.2 dB (40.0 dB MIN)	-59.2 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 228.5 MHz TO 1000.0 MHz	-42.5 dB (40.0 dB MIN)	-42.6 dB (40.0 dB MIN)	-42.6 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-12.5 °C (-15.0 TO -10.0)	+15.0 °C (12.5 TO 17.5)	+43.0 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

DA 6

TEST PERFORMED BY R. Hoggatt DATE 12/30/96

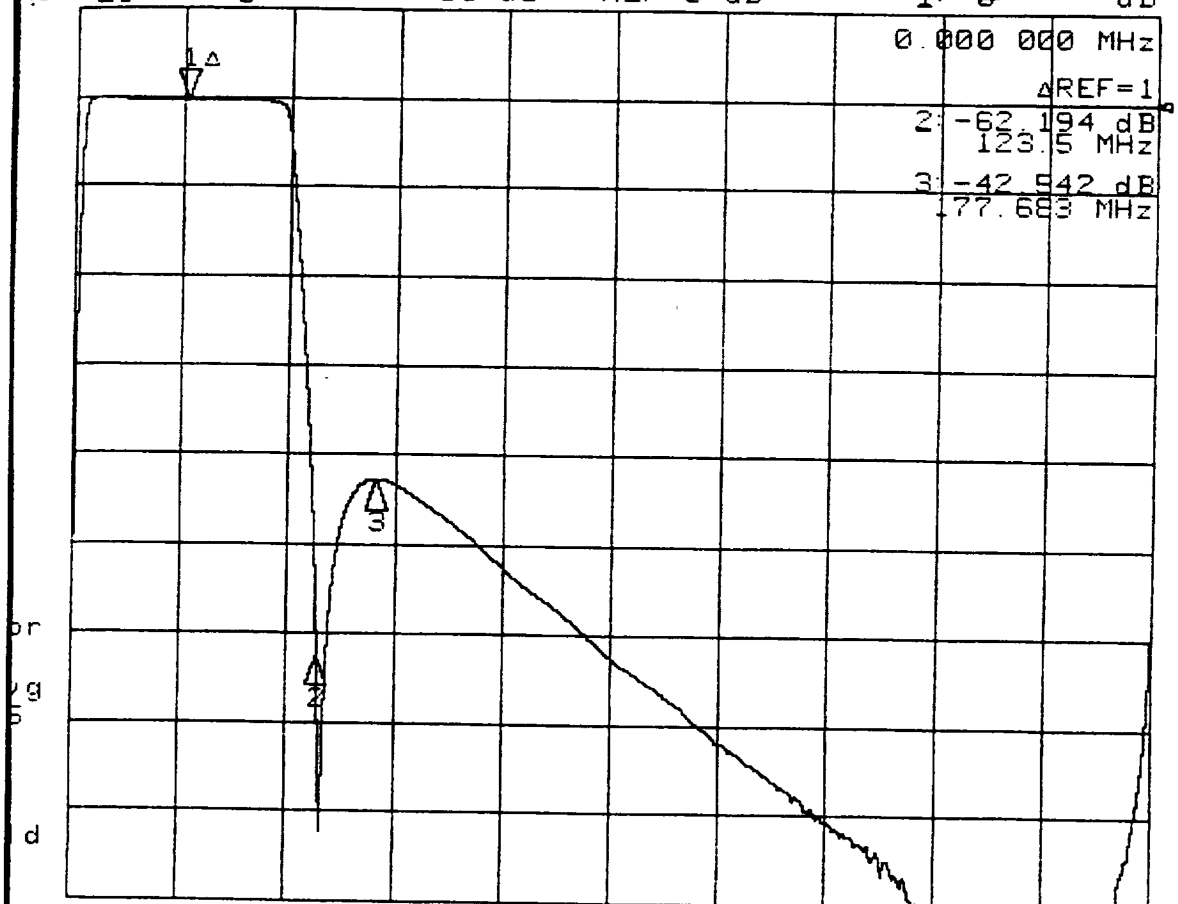
NOTE IF TEST WITNESSED BY AESD: Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION
{16} REFERENCE CUSTOMER DRAWING 1331559

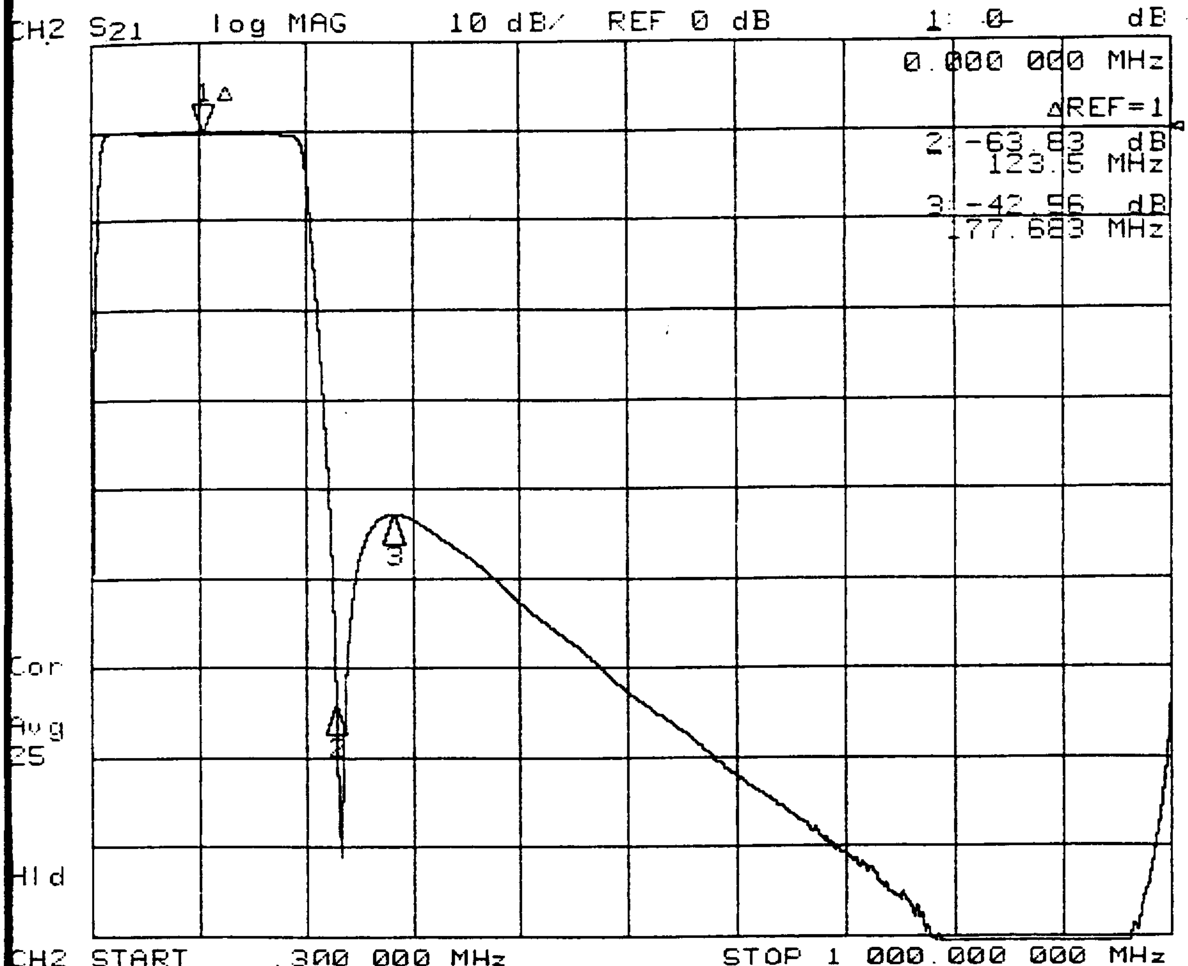
DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.500
MOUNTING HOLE CENTER	0.125 ± .010	0.127
BETWEEN UPPER MOUNTING HOLES	$\boxed{3.250}$	3.251
BETWEEN LOWER MOUNTING HOLES	$\boxed{3.250}$	3.252

CH2 S21 log MAG 10 dB/ REF 0 dB 1: -0 dB



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-022
-10C DATA
OPR: R. HOGGATT DATE DEC 3 0 1996

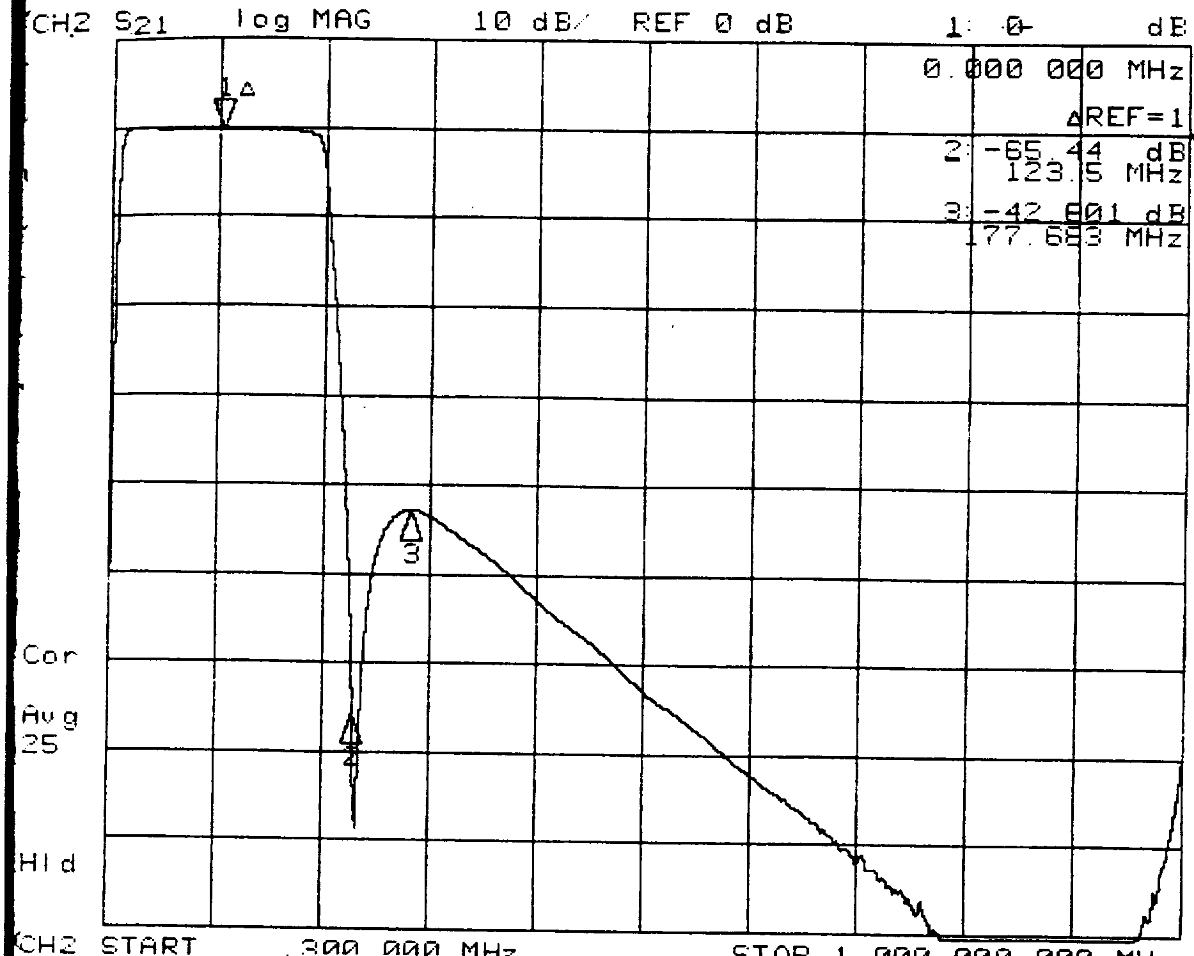
ARKER PARAMET		annel 2
ARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
ARKER 2	5.000000 MHz OFF	228.500000 MHz -62.194 dB
ARKER 3	5.000000 MHz OFF	282.683742 MHz -42.542 dB
ARKER 4	5 000000 MHz OFF	.300000 MHz OFF
KR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
FERENCE MARKER	OFF	MARKER 1
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-3 dB	-3 dB
ARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
ARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-022
+15C DATA

MARKER PARAMET **OPR: R. HOGGATT DATE** DEC 3 0 1996 nnel 2

MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -63.83 dB
MARKER 3	5.000000 MHz OFF	282.683742 MHz -42.56 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-022
+40C DATA
OPR: R. HOGGATT DATE DEC 3 0 1996

MARKER PARAMET		annel 2
MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -65.44 dB
MARKER 3	5.000000 MHz OFF	282.683742 MHz -42.601 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

APPENDIX B **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-022
AEROJET 1331559-2 REV. D

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.4 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-83.7 dB	F11	(*) 130.0	MHz	-0.21 dB
F2	1.0	MHz	-66.8 dB	F12	(*) 150.0	MHz	-0.27 dB
F3	5.0	MHz	-17.7 dB	F13	180.0	MHz	-0.43 dB
F4	7.5	MHz	-7.34 dB	F14	190.0	MHz	-0.63 dB
F5	10.0	MHz	-1.76 dB	F15	200.0	MHz	-4.08 dB
F6	20.0	MHz	-0.08 dB	F16	250.0	MHz	-48.0 dB
F7	40.0	MHz	-0.10 dB	F17	300.0	MHz	-43.5 dB
F8	(*) 60.0	MHz	-0.16 dB	F18	400.0	MHz	-52.7 dB
F9	(*) 80.0	MHz	-0.19 dB	F19	500.0	MHz	-62.7 dB
F10	105.0	MHz	-0.22 dB	F20	1000.0	MHz	-69.1 dB

DA

TEST PERFORMED BY: R. Hoggatt DATE 12/27/96

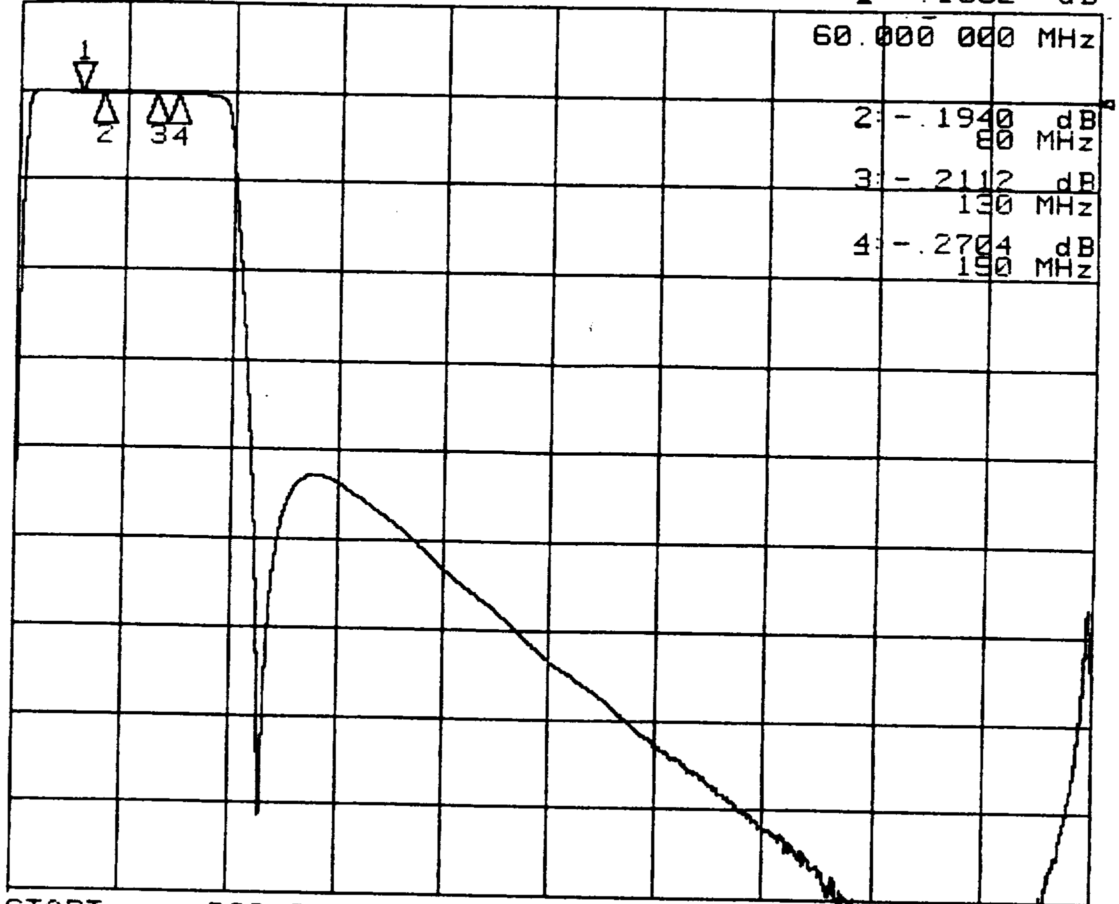
NOTE IF TEST WITNESSED BY AESD__ Not witnessed this time. DLD ___

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX B PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P228-022
AMBIENT
OPR: R. HOGGATT DATE DEC 27 1996

ARKER PARAMET		annel 2
ARKER 1	17.750000 MHz OFF	60.000000 MHz -.1562 dB
ARKER 2	157.250000 MHz OFF	80.000000 MHz -.1940 dB
ARKER 3	29.375000 MHz OFF	130.000000 MHz -.2112 dB
ARKER 4	145.625000 MHz OFF	150.000000 MHz -.2704 dB
KR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
IFERENCE MARKER	OFF	OFF
ACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
ARKER TRACKING	OFF	OFF

Report No. 11491
June 1999

Channel 5 Bandpass Filter

IF Filter (S/N: 1331559-5, S/N: P231-007)

ACCEPTANCE TEST REPORT

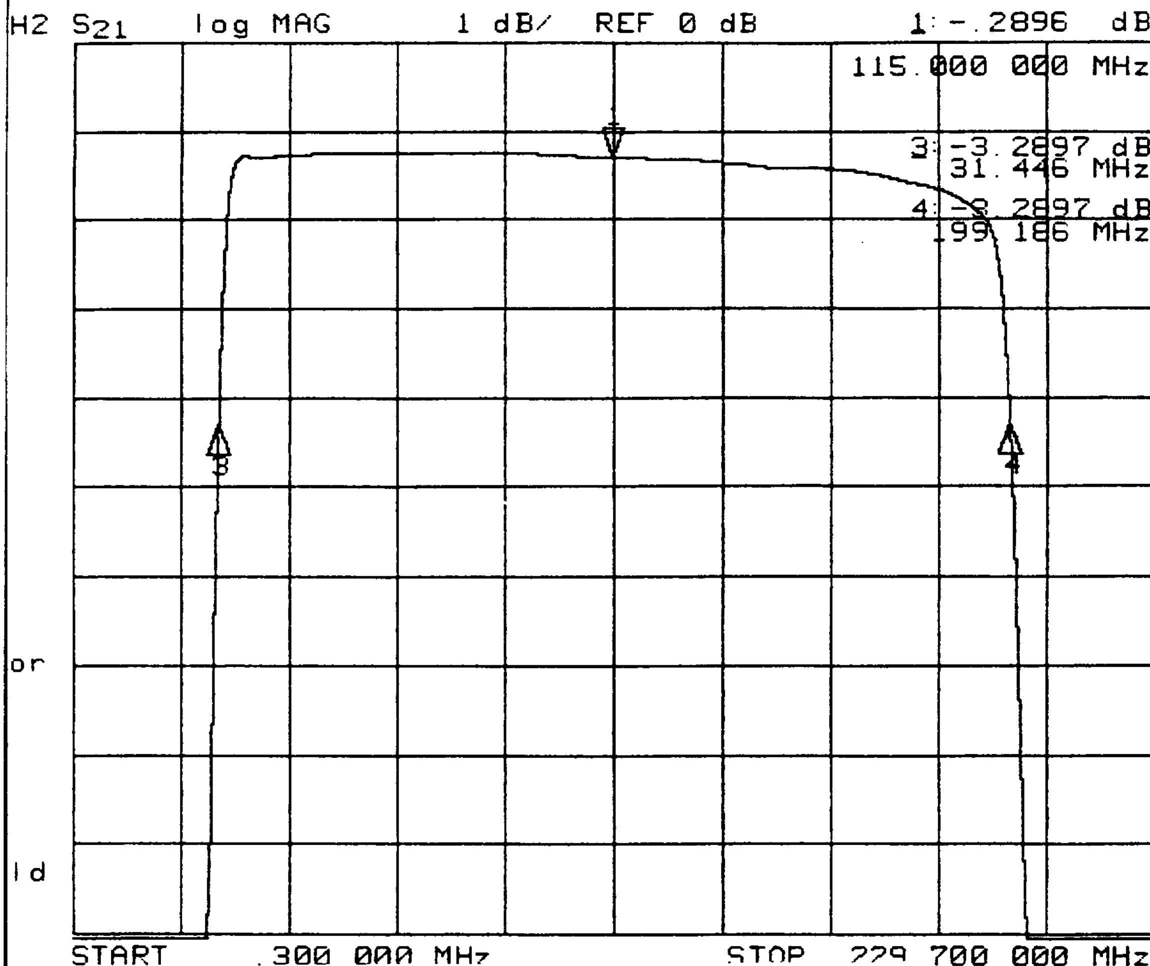
BANDPASS FILTER MODEL HL115-170-10SS1 S/N P231-007
AEROJET 1331559-5 REV. E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-010 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	199.19 MHz (198.0-200.0)	198.86 Mhz (198.0-200.0)	198.54 MHz (198.0-200.0)
{8} LOWER 3.0 dB BANDEDGE	31.45 MHz (30.0-32.0)	31.38 Mhz (30.0-32.0)	31.33 MHz (30.0-32.0)
{9} 3.0 dB RELATIVE BANDWIDTH	167.74 MHz (166.0-170.0)	167.48 Mhz (166.0-170.0)	167.21 MHz (166.0-170.0)
{10} ADD {7} AND {8} ÷ 2 =	115.32 MHz (115.0 NOM)	115.12 MHz (115.0 NOM)	114.94 Mhz (115.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.0 °C (-15.0 TO -10.0)	+16.1 °C (12.5 TO 17.5)	+43.0 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

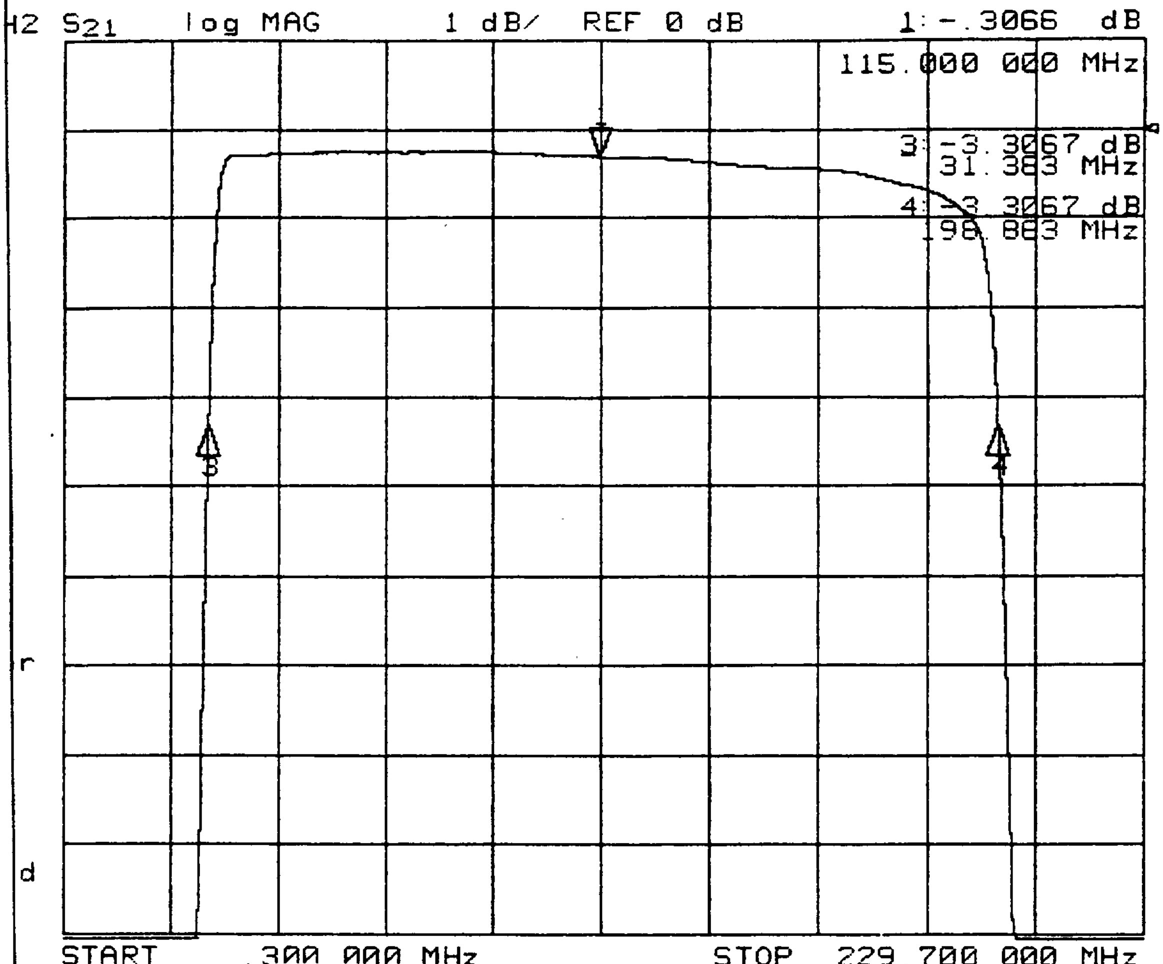
PASSBAND RIPPLE

ACCEPTANCE TEST PROCEDURE 63-0005-010 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	88.62 MHz	79.44 Mhz	79.44 MHz
MIN INSERTION LOSS PERFORMANCE	-0.23 dB	-0.25 dB	-0.26 dB
{11b} 75% BW LOWER BANDEDGE FREQ	34.57 MHz	34.42 Mhz	34.32 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.42 dB	-0.45 dB	-0.47 dB
{11c} 75% BW UPPER BANDEDGE FREQ	162.07 MHz	161.92 Mhz	161.82 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.42 dB	-0.45 dB	-0.47 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.19 dB	0.20 dB	0.21 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.19 dB	0.20 dB	0.21 dB



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P231-007
-10C DATA
OPR: R. HOGGATT DATE DEC 27 1996

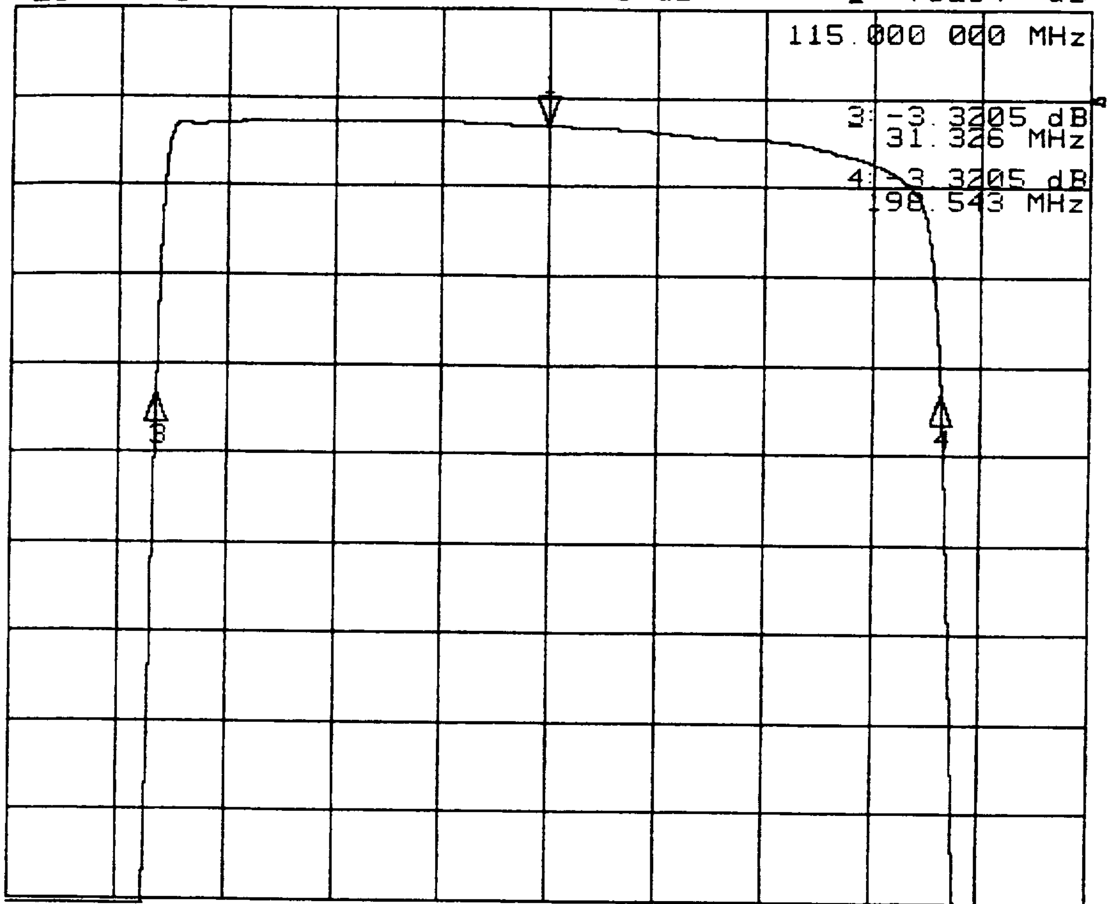
ARKER PARAME		annel 2
ARKER 1	38.500000 MHz OFF	115.000000 MHz -.2896 dB
ARKER 2	191.500000 MHz OFF	115.316545 MHz OFF
ARKER 3	51.250000 MHz OFF	31.446349 MHz -3.2897 dB
ARKER 4	178.750000 MHz OFF	199.186741 MHz -3.2897 dB
KR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
ARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P231-007
+15C DATA
OPR: R. HOGGATT DATE DEC 27 1996

RKER PARAMET		annel 2
RKER 1	38.500000 MHz OFF	115.000000 MHz -.3066 dB
RKER 2	191.500000 MHz OFF	115.123629 MHz OFF
RKER 3	51.250000 MHz OFF	31.383397 MHz -3.3067 dB
RKER 4	178.750000 MHz OFF	198.863861 MHz -3.3067 dB
R STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
FERENCE MARKER	OFF	OFF
ACEMENT	CONTINUOUS	CONTINUOUS
RKER SEARCH	OFF	OFF
RGET VALUE	-14 dB	-3 dB
RKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
RKER TRACKING	OFF	OFF

CH2 S21 log MAG 1 dB/ REF 0 dB 1: -.3204 dB



START .300 000 MHz STOP 229.700 000 MHz

FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P231-007
+40C DATA

ARKER PARAMET OPR: R. HOGGATT DATE DEC 27 1996 annel 2

ARKER 1	38.500000 MHz OFF	115.000000 MHz -.3204 dB
ARKER 2	191.500000 MHz OFF	114.935061 MHz OFF
ARKER 3	51.250000 MHz OFF	31.326738 MHz -3.3205 dB
ARKER 4	178.750000 MHz OFF	198.543385 MHz -3.3205 dB
R STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
FERENCE MARKER	OFF	OFF
ACEMENT	CONTINUOUS	CONTINUOUS
RKER SEARCH	OFF	OFF
RGET VALUE	-14 dB	-3 dB
RKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
RKER TRACKING	OFF	OFF

APPENDIX E ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL115-170-10SS1 S/N P231-007
AEROJET 1331559-5 REV. E

PASSBAND RIPPLE (CON'T)

	-10°C	+15°C	+40°C
{11f} RECORD PASS/FAIL (0.5 dB MAX)	PASS/FAIL	PASS/FAIL	PASS/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE
63-0005-010 PARA 4.5.5
Fc=115.0 MHz
REF {5A} FOR INSERTION LOSS @ Fc

	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 4.5 MHz	>90 dB (40.0 dB MIN)	>90 dB (40.0 dB MIN)	>90 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 225.5 MHz TO 1000.0 MHz	-60.8 dB (40.0 dB MIN)	-61.9 dB (40.0 dB MIN)	-62.9 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-11.8 °C (-15.0 TO -10.0)	+16.1 °C (12.5 TO 17.5)	+42.8 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

DA 5

TEST PERFORMED BY R. Hoggan DATE 12/27/96

NOTE IF TEST WITNESSED BY AESD: ________ GSI: Not witnessed this time. DLD

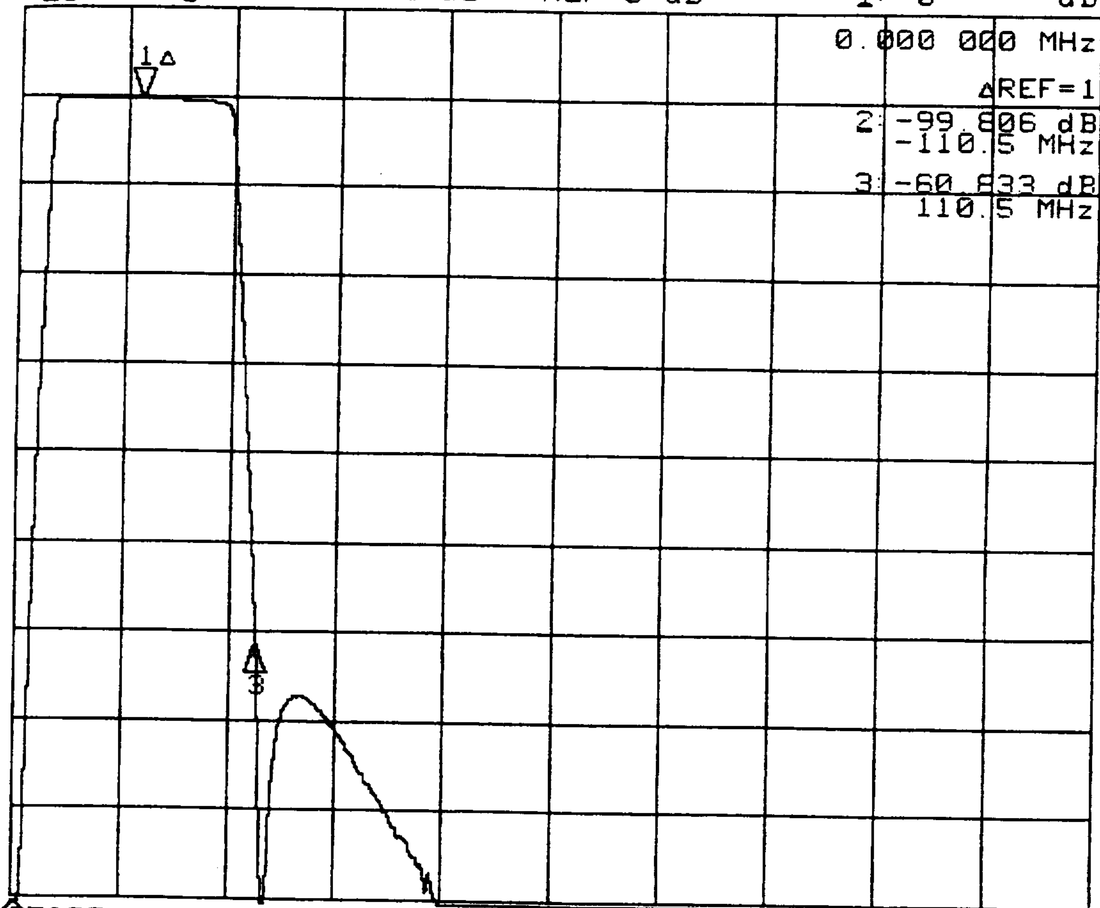
***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

{16} REFERENCE CUSTOMER DRAWING 1331559

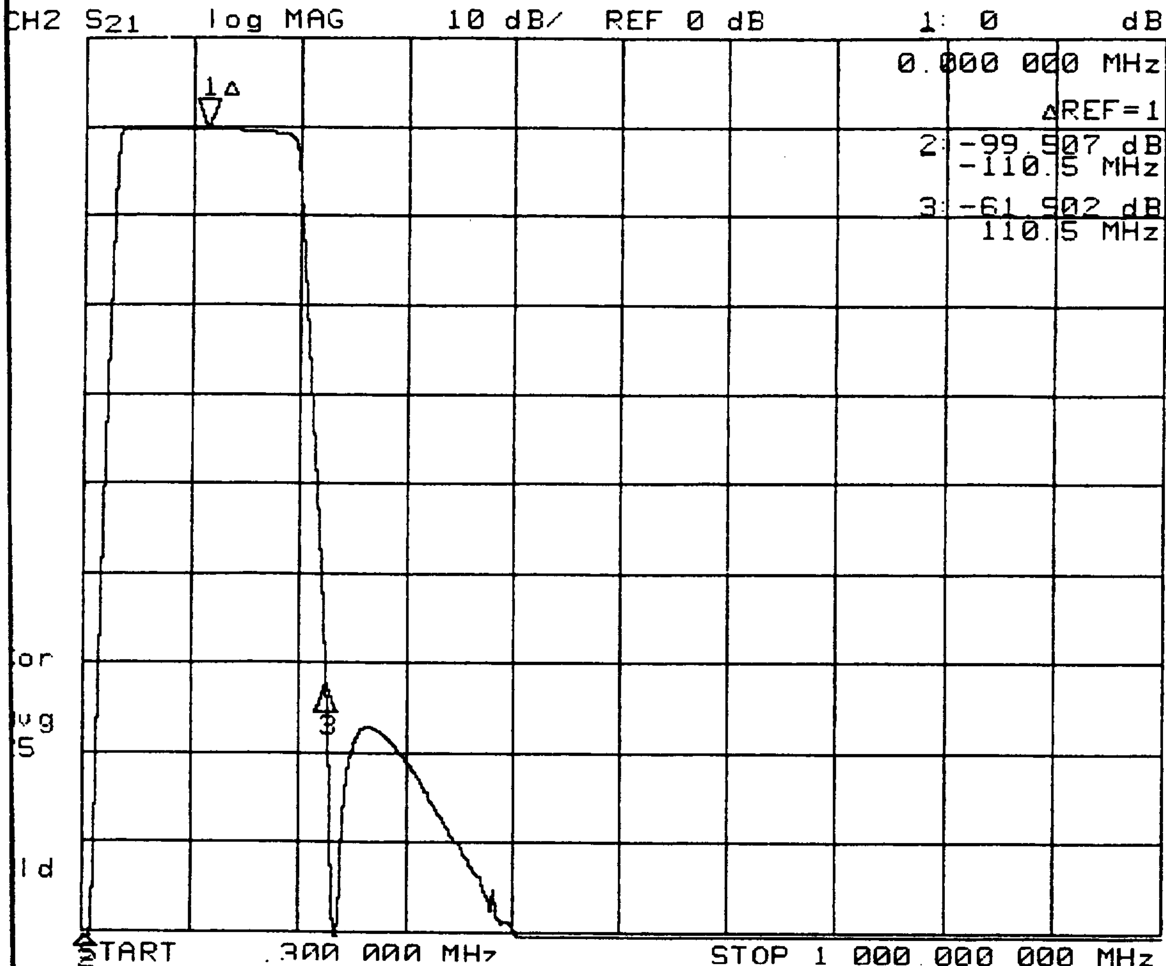
DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.500
MOUNTING HOLE CENTER	0.125 ± .010	0.126
BETWEEN UPPER MOUNTING HOLES	$\boxed{3.250}$	3.250
BETWEEN LOWER MOUNTING HOLES	$\boxed{3.250}$	3.250

CH2 S21 log MAG 10 dB/ REF 0 dB 1: 0 dB



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P231-007
-10C DATA
OPR: R. HOGGATT DATE DEC 27 1996

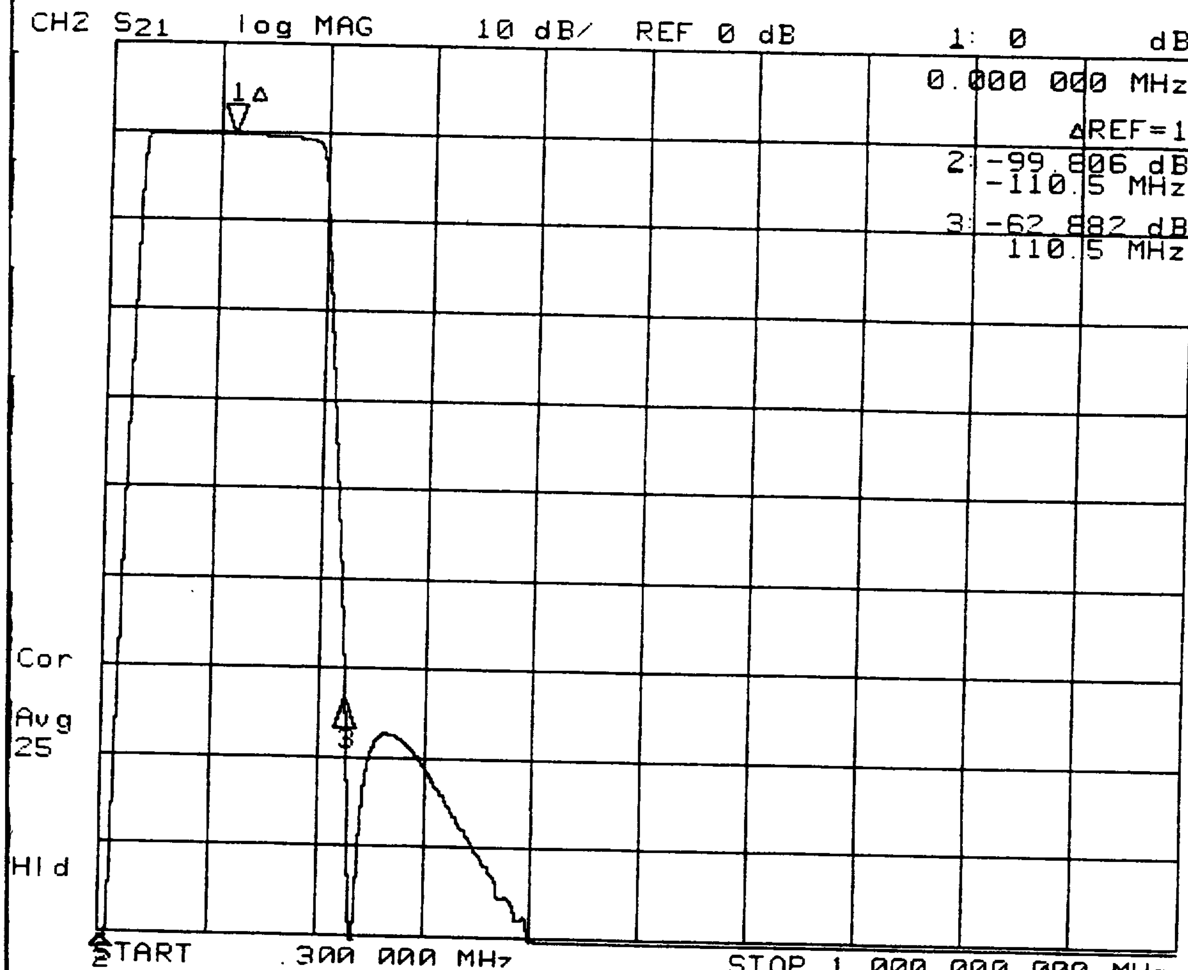
MARKER PARAME		annel 2
MARKER 1	1000.000000 MHz OFF	115.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	4.500000 MHz -99.806 dB
MARKER 3	1000.000000 MHz OFF	225.500000 MHz -60.833 dB
MARKER 4	1000.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF	OFF
	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P231-007
+15C DATA

ARKER PARAME OPR: R. HOGGATT DATE DEC 27 1996 annel 2

ARKER 1	1000.000000 MHz OFF	115.000000 MHz 0 dB
ARKER 2	1000.000000 MHz OFF	4.500000 MHz -99.507 dB
ARKER 3	1000.000000 MHz OFF	225.500000 MHz -61.902 dB
ARKER 4	1000.000000 MHz OFF	1000.000000 MHz OFF
KR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
FERENCE MARKER	OFF	MARKER 1
ACEMENT	CONTINUOUS	CONTINUOUS
RKER SEARCH	OFF	OFF
RGET VALUE	-3 dB	-3 dB
RKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
RKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P231-007
+40C DATA
OPR: R. HOGGATT DATE DEC 27 1996

MARKER PARAMET		annel 2
MARKER 1	1000.000000 MHz OFF	115.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	4.500000 MHz -99.806 dB
MARKER 3	1000.000000 MHz OFF	225.500000 MHz -62.882 dB
MARKER 4	1000.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

BANDPASS FILTER MODEL HL115-170-10SS1 S/N P231-007
AEROJET 1331559-5 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.0 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-105.7 dB	F11	(*) 130.0	MHz	-0.31 dB
F2	1.0	MHz	-105.0 dB	F12	(*) 155.0	MHz	-0.45 dB
F3	10.0	MHz	-85.8 dB	F13	180.0	MHz	-0.66 dB
F4	20.0	MHz	-40.6 dB	F14	190.0	MHz	-0.86 dB
F5	30.0	MHz	-6.94 dB	F15	200.0	MHz	-4.90 dB
F6	40.0	MHz	-0.30 dB	F16	210.0	MHz	-26.2 dB
F7	50.0	MHz	-0.26 dB	F17	300.0	MHz	-71.1 dB
F8	(*) 75.0	MHz	-0.26 dB	F18	400.0	MHz	-90.6 dB
F9	(*) 100.0	MHz	-0.27 dB	F19	500.0	MHz	-97.3 dB
F10	115.0	MHz	-0.30 dB	F20	1000.0	MHz	-100.1 dB

TEST PERFORMED BY: R. Hoggatt DATE 12/21/96

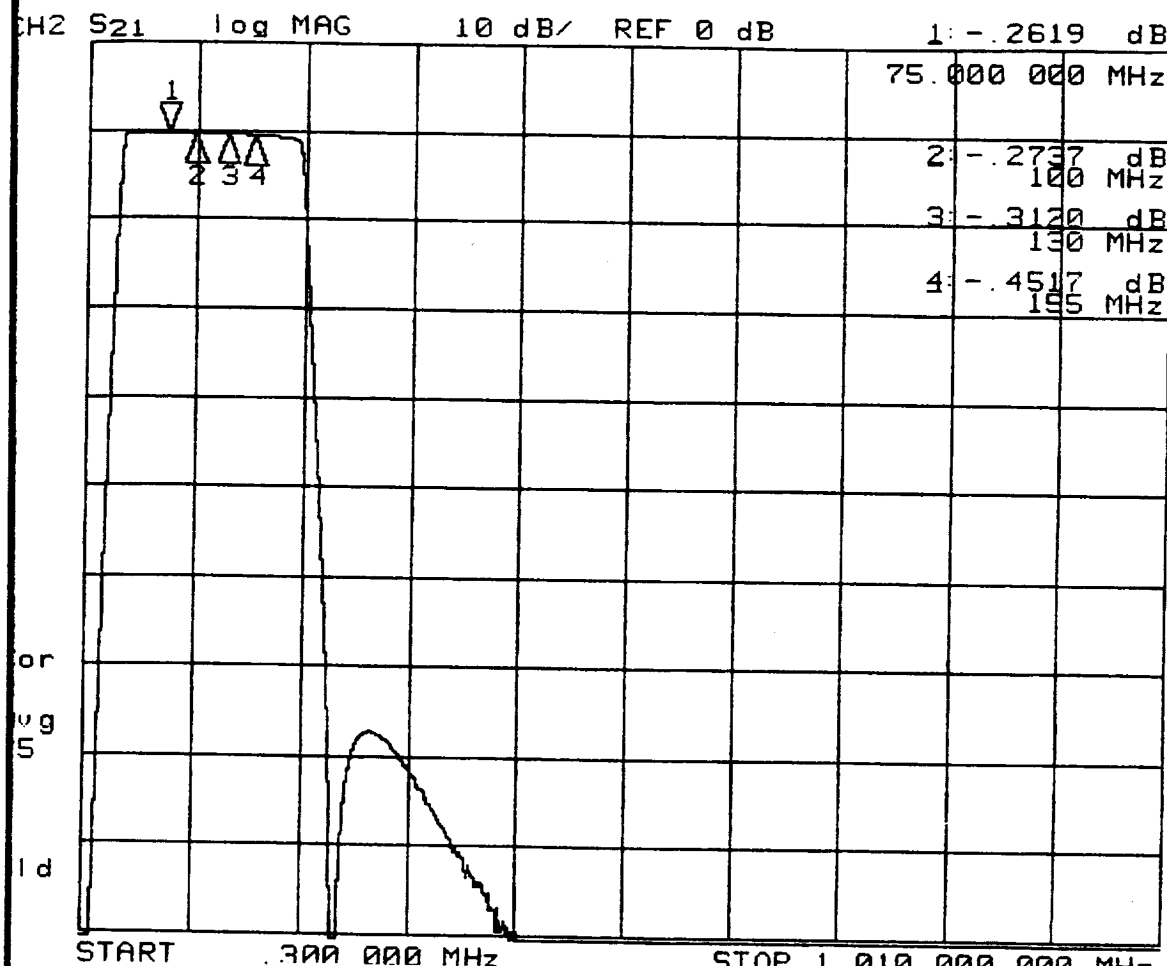
NOTE IF TEST WITNESSED BY AESD______ GSI _ Not witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-010 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX E PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P231-007
AMBIENT
OPR: R. HOGGATT DATE DEC 2 1 1996

ARKER PARAME		annel 2
ARKER 1	17.750000 MHz OFF	75.000000 MHz -.2619 dB
ARKER 2	157.250000 MHz OFF	100.000000 MHz -.2737 dB
ARKER 3	29.375000 MHz OFF	130.000000 MHz -.3120 dB
ARKER 4	145.625000 MHz OFF	155.000000 MHz -.4517 dB
KR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
ARKER TRACKING	OFF	OFF

Report No. 11491
June 1999

Channel 6 Bandpass Filter

IF Filter (S/N: 1331559-2, S/N: P228-011)

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-011
AEROJET 1331559-2 REV. E

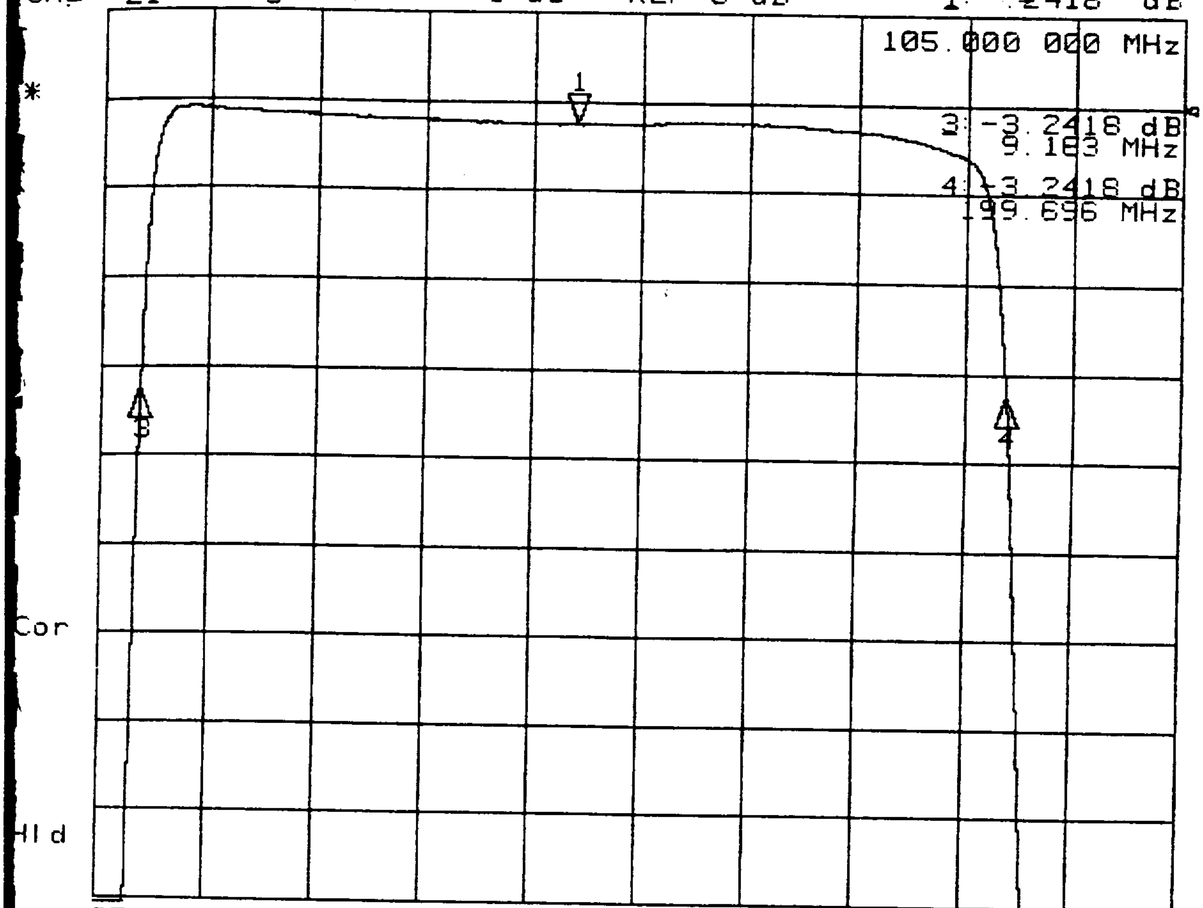
3.0 dB BANDWIDTH
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.5.3

	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	199.70 MHz (198.0-200.0)	199.33 Mhz (198.0-200.0)	198.98 MHz (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	9.16 MHz (8.0-10.0)	9.15 Mhz (8.0-10.0)	9.14 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	190.54 MHz (188.0-192.0)	190.18 Mhz (188.0-192.0)	189.84 MHz (188.0-192.0)
{10} ADD {7} AND {8} ÷ 2 =	104.43 MHz (105.0 NOM)	104.24 MHz (105.0 NOM)	104.06 Mhz (105.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-14.3 °C (-15.0 TO -10.0)	+15.9 °C (12.5 TO 17.5)	+43.2 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

PASSBAND RIPPLE
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.5.4

	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	19.91 MHz	19.91 Mhz	20.50 MHz
MIN INSERTION LOSS PERFORMANCE	-0.08 dB	-0.08 dB	-0.08 dB
{11b} 75% BW LOWER BANDEDGE FREQ	14.02 MHz	13.94 Mhz	13.83 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.26 dB	-0.27 dB	-0.29 dB
{11c} 75% BW UPPER BANDEDGE FREQ	156.52 MHz	156.44 Mhz	156.33 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.26 dB	-0.27 dB	-0.29 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.18 dB	0.19 dB	0.21 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.18 dB	0.19 dB	0.21 dB

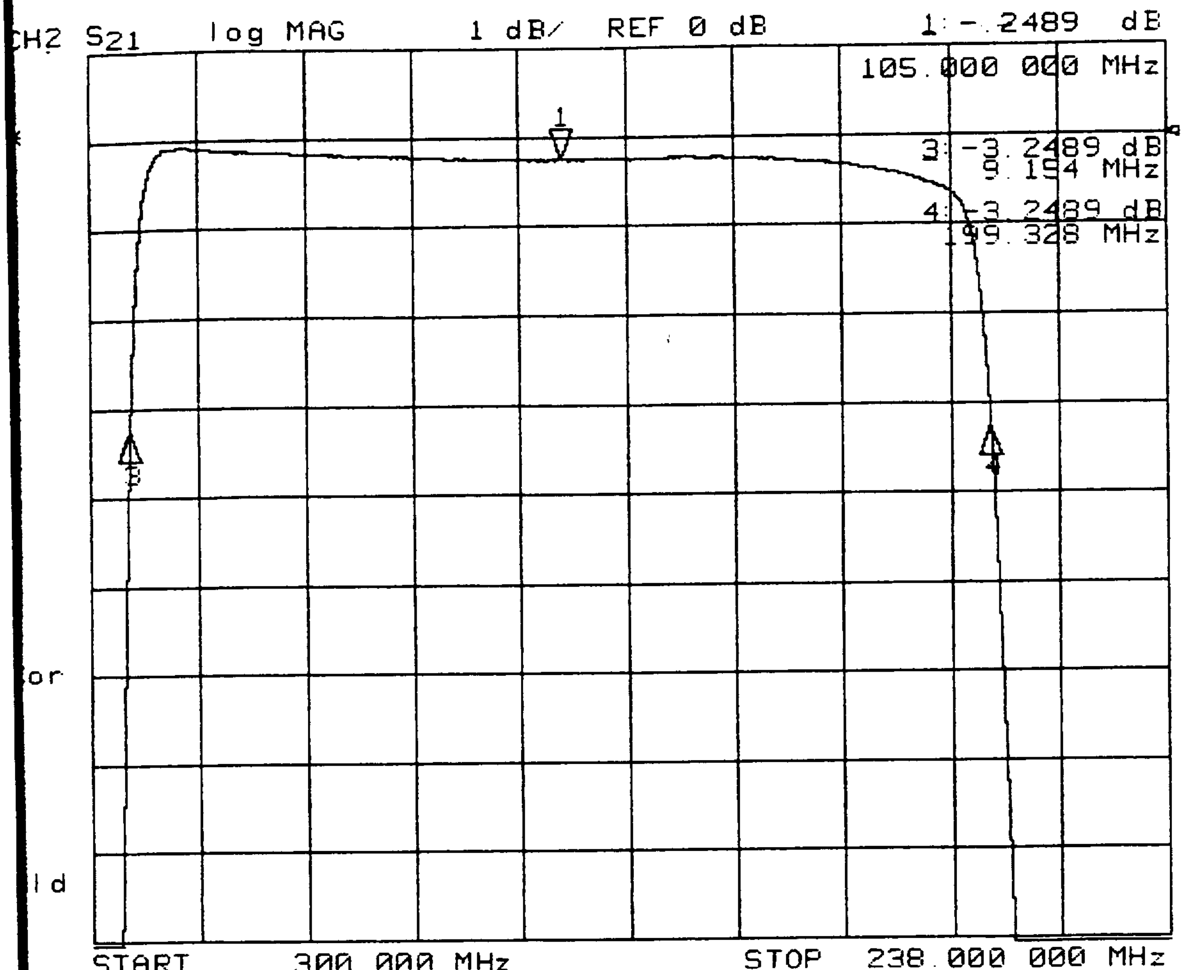
CH2 S21 log MAG 1 dB/ REF 0 dB 1: -.2418 dB



START .300 000 MHz STOP 238 000 000 MHz

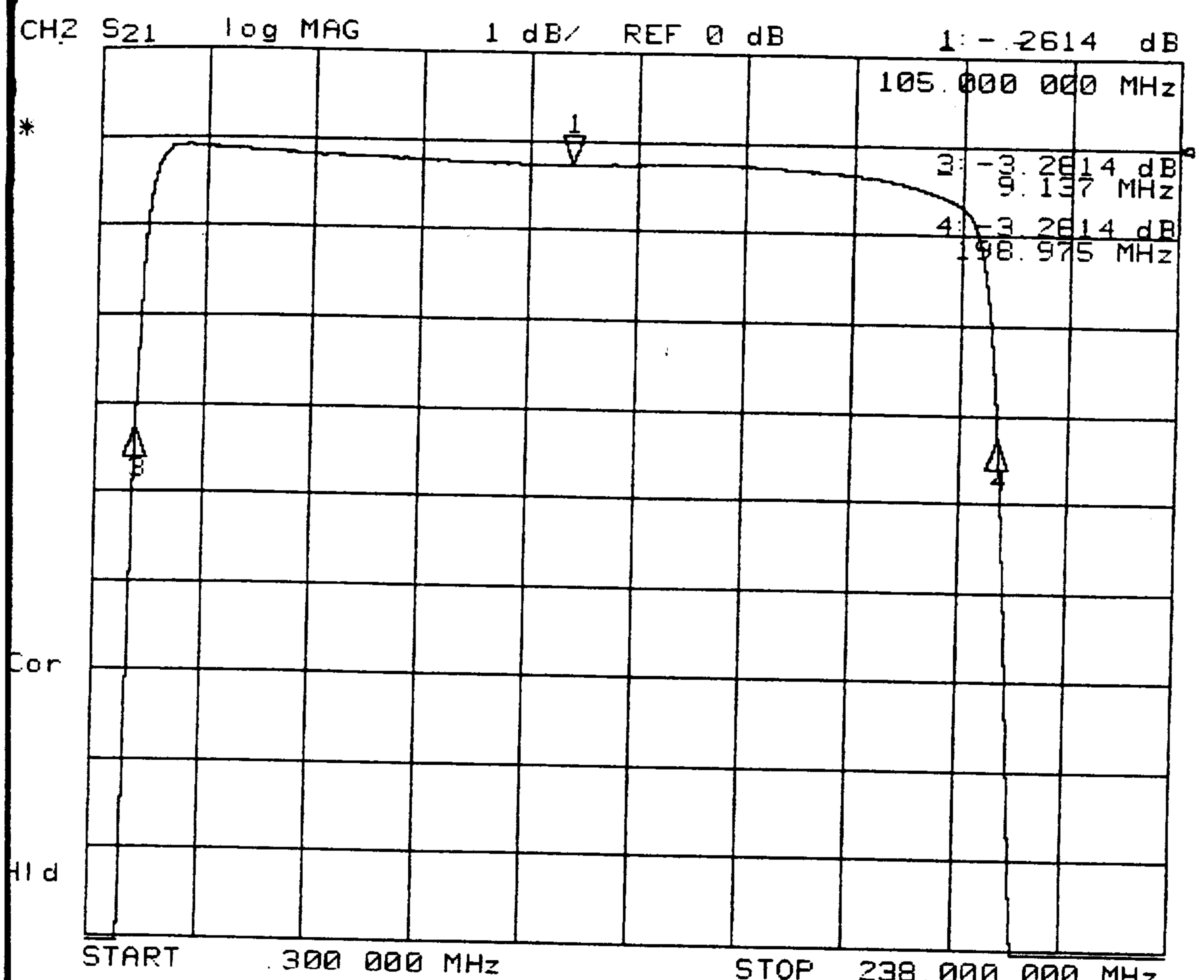
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-011
-10C DATA
OPR: R. HOGGATT DATE DEC 28 1996

MARKER PARAMET		annel 2
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.2418 dB
MARKER 2	190.500000 MHz OFF	104.429771 MHz OFF
MARKER 3	33.750000 MHz OFF	9.163214 MHz -3.2418 dB
MARKER 4	176.250000 MHz OFF	199.696328 MHz -3.2418 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
ARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-011
+15C DATA
OPR: R. HOGGATT DATE DEC 28 1996

ARKER PARAMET		annel 2
ARKER 1	19.500000 MHz OFF	105.000000 MHz -.2489 dB
ARKER 2	190.500000 MHz OFF	104.241274 MHz OFF
ARKER 3	33.750000 MHz OFF	9.154504 MHz -3.2489 dB
ARKER 4	176.250000 MHz OFF	199.328045 MHz -3.2489 dB
KR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
ARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-011
+40C DATA
OPR: R. HOGGATT DATE DEC 28 1996

ARKER PARAMET		annel 2
ARKER 1	19.500000 MHz OFF	105.000000 MHz -.2614 dB
ARKER 2	190.500000 MHz OFF	104.056431 MHz OFF
ARKER 3	33.750000 MHz OFF	9.137068 MHz -3.2614 dB
ARKER 4	176.250000 MHz OFF	198.975794 MHz -3.2614 dB
KR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
ACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
ARKER TRACKING	OFF	OFF

APPENDIX B **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-011
AEROJET 1331559-2 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	PASS/FAIL	PASS/FAIL	PASS/FAIL
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=105.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-59.2 dB (40.0 dB MIN)	-59.1 dB (40.0 dB MIN)	-59.1 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 228.5 MHz TO 1000.0 MHz	-41.1 dB (40.0 dB MIN)	-41.1 dB (40.0 dB MIN)	-41.2 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-14.4 °C (-15.0 TO -10.0)	+15.7 °C (12.5 TO 17.5)	+43.5 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

TEST PERFORMED BY R. Hoggatt DATE 12/27/96

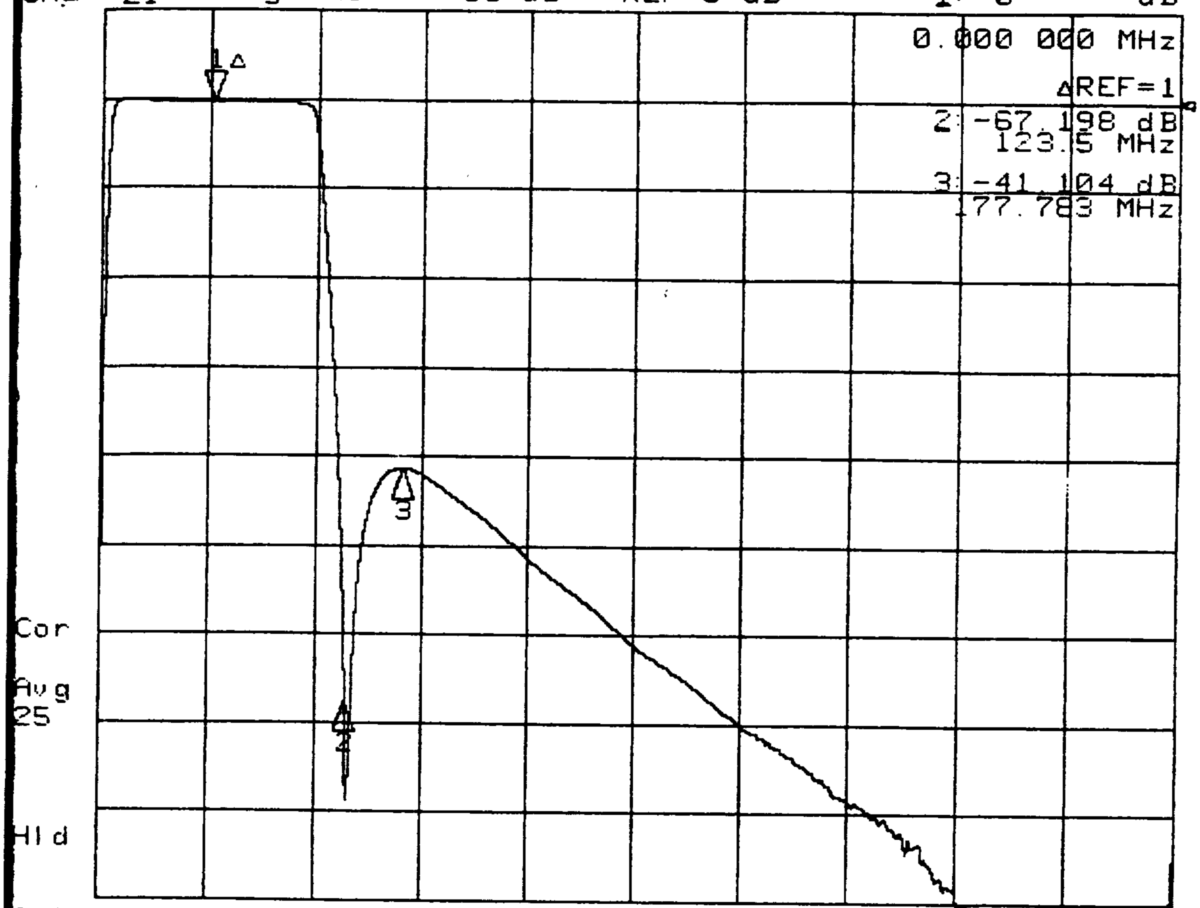
NOTE IF TEST WITNESSED BY AESD: ________ GSI: _ Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.501
MOUNTING HOLE CENTER	0.125 ± .010	0.126
BETWEEN UPPER MOUNTING HOLES	3.250	3.250
BETWEEN LOWER MOUNTING HOLES	3.250	3.250

CH2 S21 log MAG 10 dB/ REF 0 dB 1: 0- dB

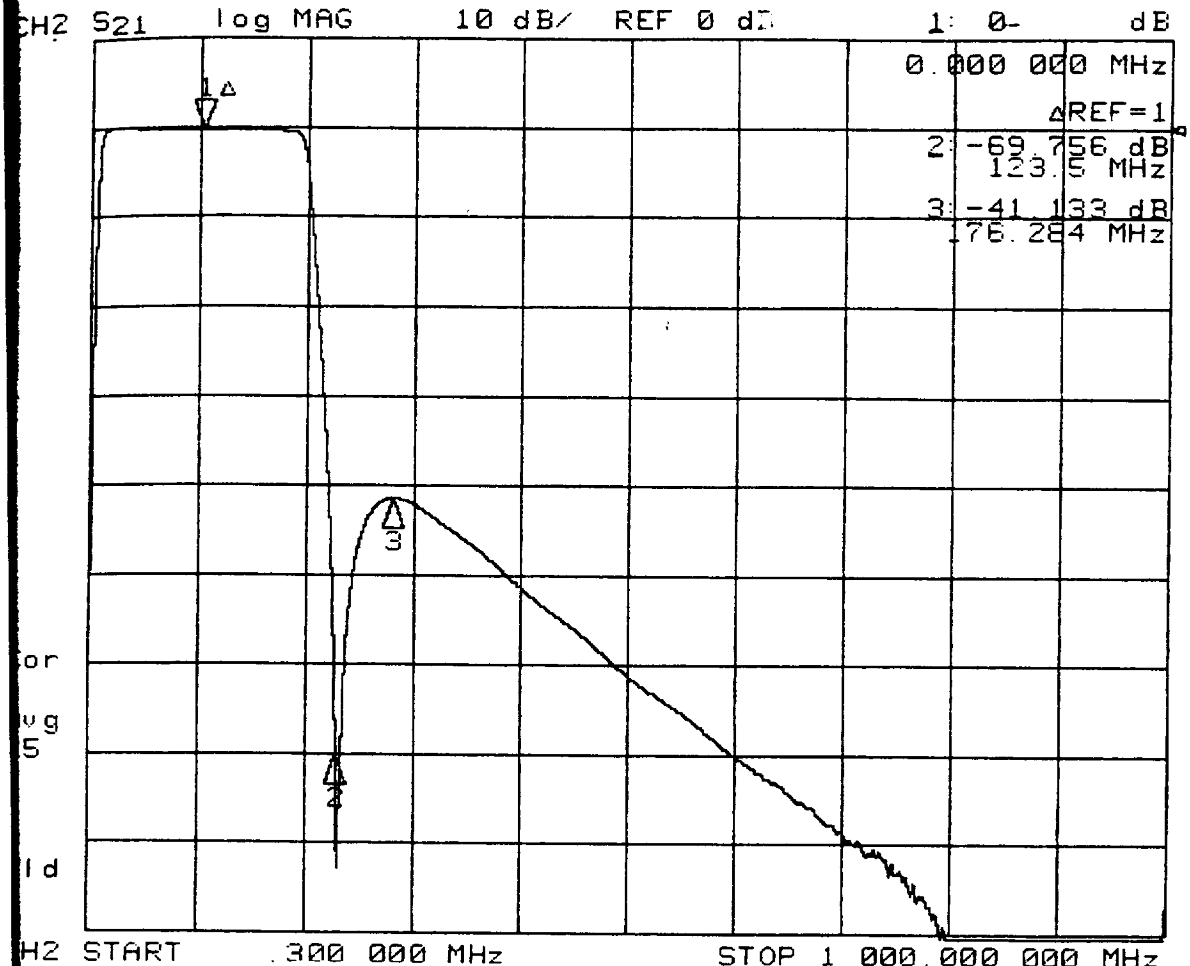


CH2 START .300 000 MHz STOP 1 000.000 000 MHz

FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-011
-10C DATA
OPR: R. HOGGATT DATE DEC 28 1996

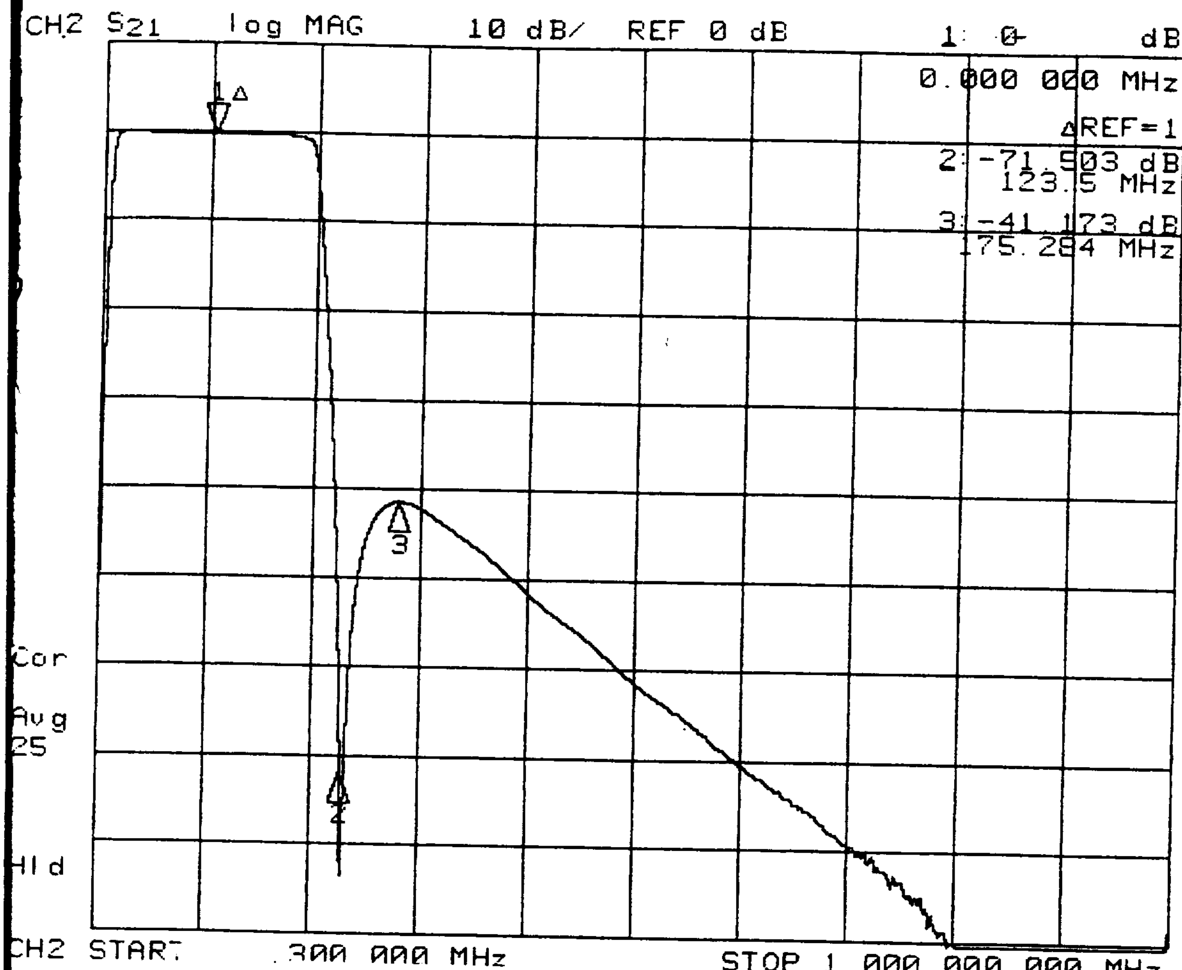
MARKER PARAME annel 2

MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -67.198 dB
MARKER 3	5.000000 MHz OFF	282.783712 MHz -41.104 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-011
+15C DATA
OPR: R. HOGGATT DATE DEC 28 1996

ARKER PARAMET	annel 2	
ARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
ARKER 2	5.000000 MHz OFF	228.500000 MHz -69.756 dB
ARKER 3	5.000000 MHz OFF	281.284162 MHz -41.133 dB
ARKER 4	5.000000 MHz OFF	.300000 MHz OFF
KR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
FERENCE MARKER	OFF	MARKER 1
ACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-3 dB	-3 dB
ARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
ARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-011
+40C DATA
OPR: R. HOGGATT DATE DEC 28 1996

MARKER PARAME		annel 2
MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -71.503 dB
MARKER 3	5.000000 MHz OFF	280.284462 MHz -41.173 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

APPENDIX B ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-011
AEROJET 1331559-2 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.4 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-82.8 dB	F11	(*) 130.0	MHz	-0.24 dB
F2	1.0	MHz	-66.3 dB	F12	(*) 150.0	MHz	-0.25 dB
F3	5.0	MHz	-17.8 dB	F13	180.0	MHz	-0.43 dB
F4	7.5	MHz	-7.44 dB	F14	190.0	MHz	-0.62 dB
F5	10.0	MHz	-1.84 dB	F15	200.0	MHz	-3.97 dB
F6	20.0	MHz	-0.08 dB	F16	250.0	MHz	-45.9 dB
F7	40.0	MHz	-0.11 dB	F17	300.0	MHz	-47.1 dB
F8	(*) 60.0	MHz	-0.18 dB	F18	400.0	MHz	-51.5 dB
F9	(*) 80.0	MHz	-0.24 dB	F19	500.0	MHz	-61.3 dB
F10	105.0	MHz	-0.25 dB	F20	1000.0	MHz	-88.6 dB

DA 5

TEST PERFORMED BY: R. Hoggatt DATE 12/27/96

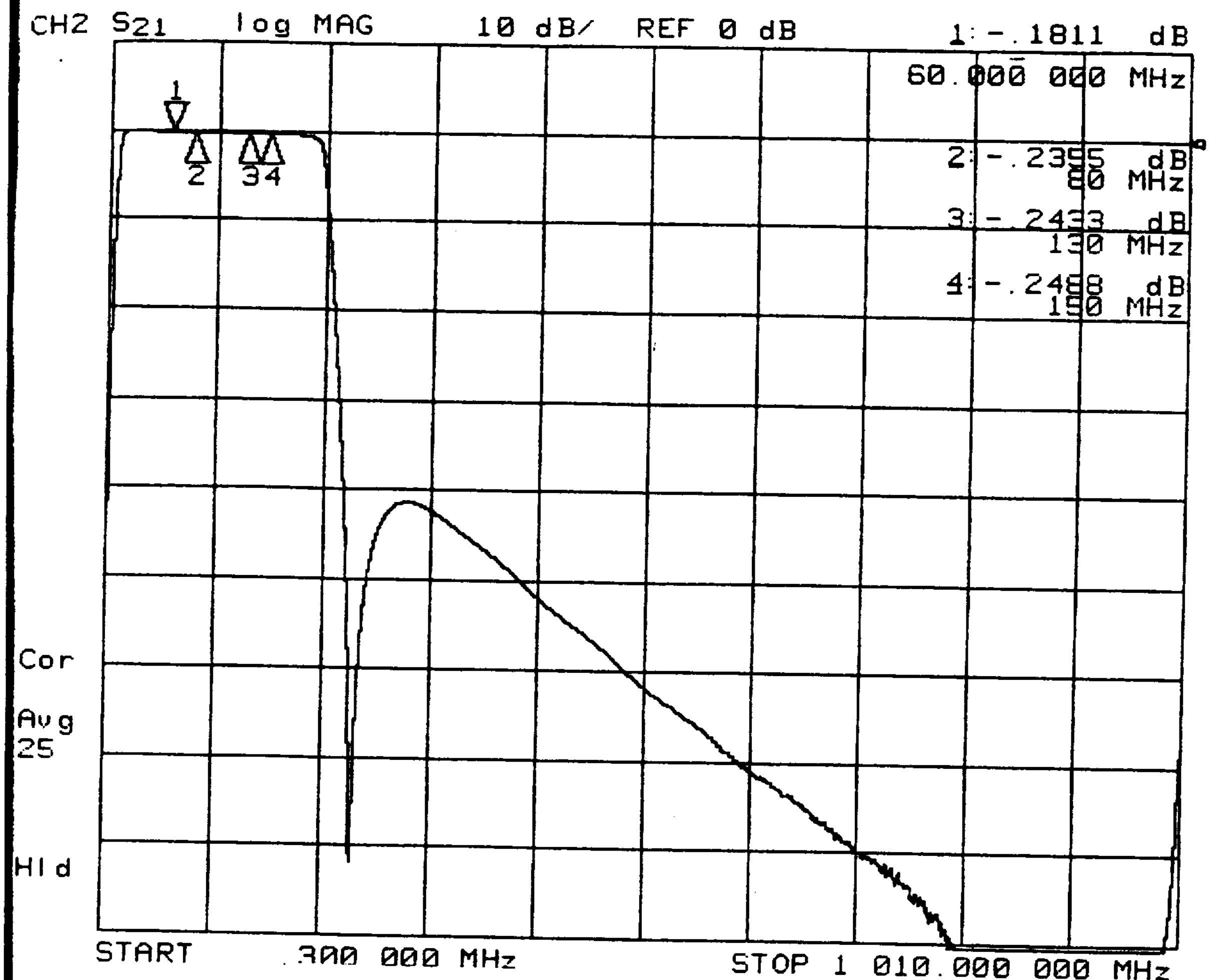
NOTE IF TEST WITNESSED BY AESD______ GSI _ Not witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX B PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P228-011
AMBIENT
OPR: R. HOGGATT DATE DEC 27 1996

MARKER PARAME		ıannel 2
MARKER 1	17.750000 MHz OFF	60.000000 MHz -.1811 dB
MARKER 2	157.250000 MHz OFF	80.000000 MHz -.2355 dB
MARKER 3	29.375000 MHz OFF	130.000000 MHz -.2433 dB
MARKER 4	145.625000 MHz OFF	150.000000 MHz -.2488 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Report No. 11491
June 1999

Channel 7 Bandpass Filter

IF Filter (S/N: 1331559-2, S/N: P228-019)

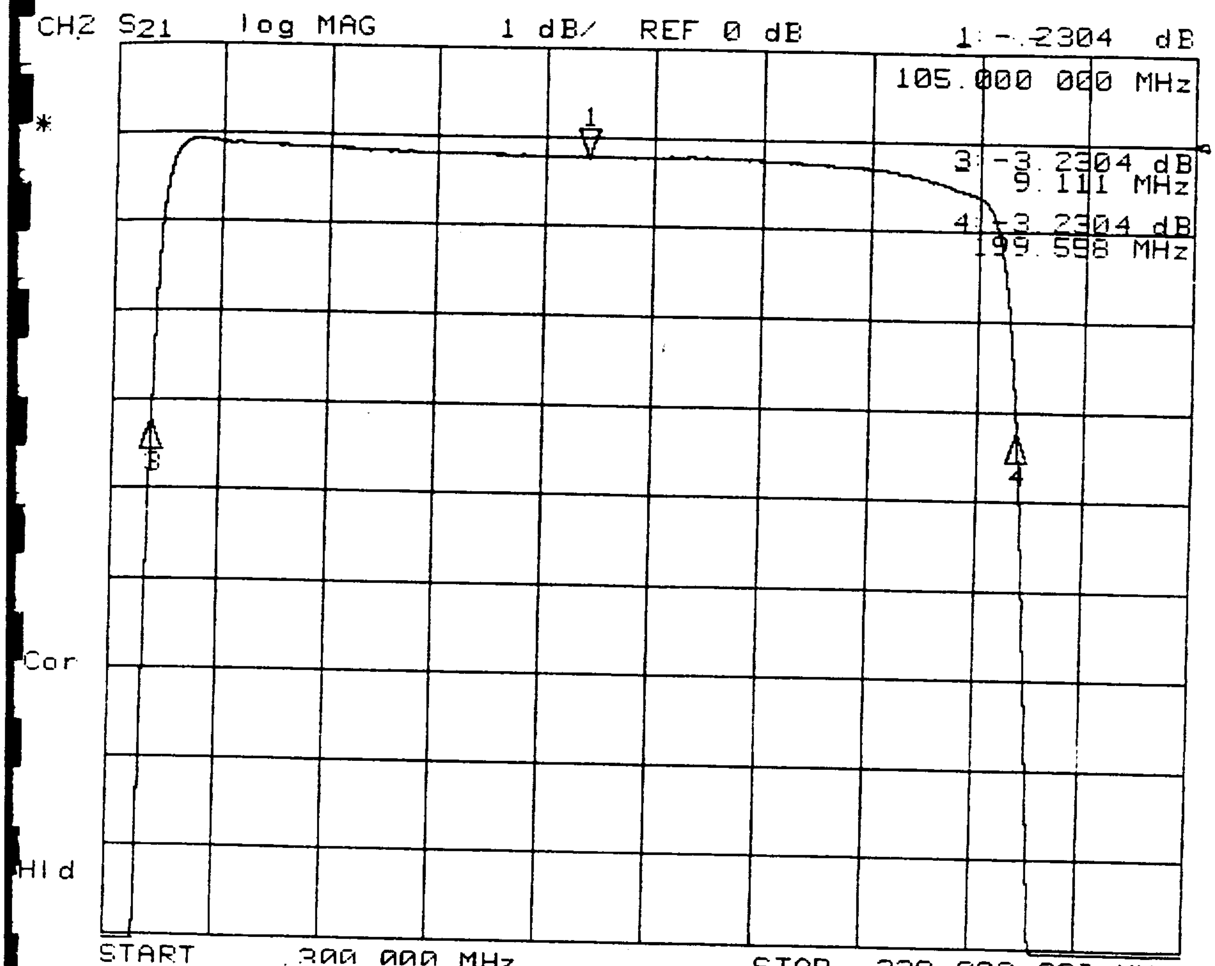
BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-019
AEROJET 1331559-2 REV. E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	199.56 MHz (198.0-200.0)	199.19 Mhz (198.0-200.0)	198.83 MHz (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	9.11 MHz (8.0-10.0)	9.10 Mhz (8.0-10.0)	9.09 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	190.45 MHz (188.0-192.0)	190.09 Mhz (188.0-192.0)	189.74 MHz (188.0-192.0)
{10} ADD {7} AND {8} ÷ 2 =	104.34 MHz (105.0 NOM)	104.15 MHz (105.0 NOM)	103.96 Mhz (105.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-13.6 °C (-15.0 TO -10.0)	+15.5 °C (12.5 TO 17.5)	+44.5 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

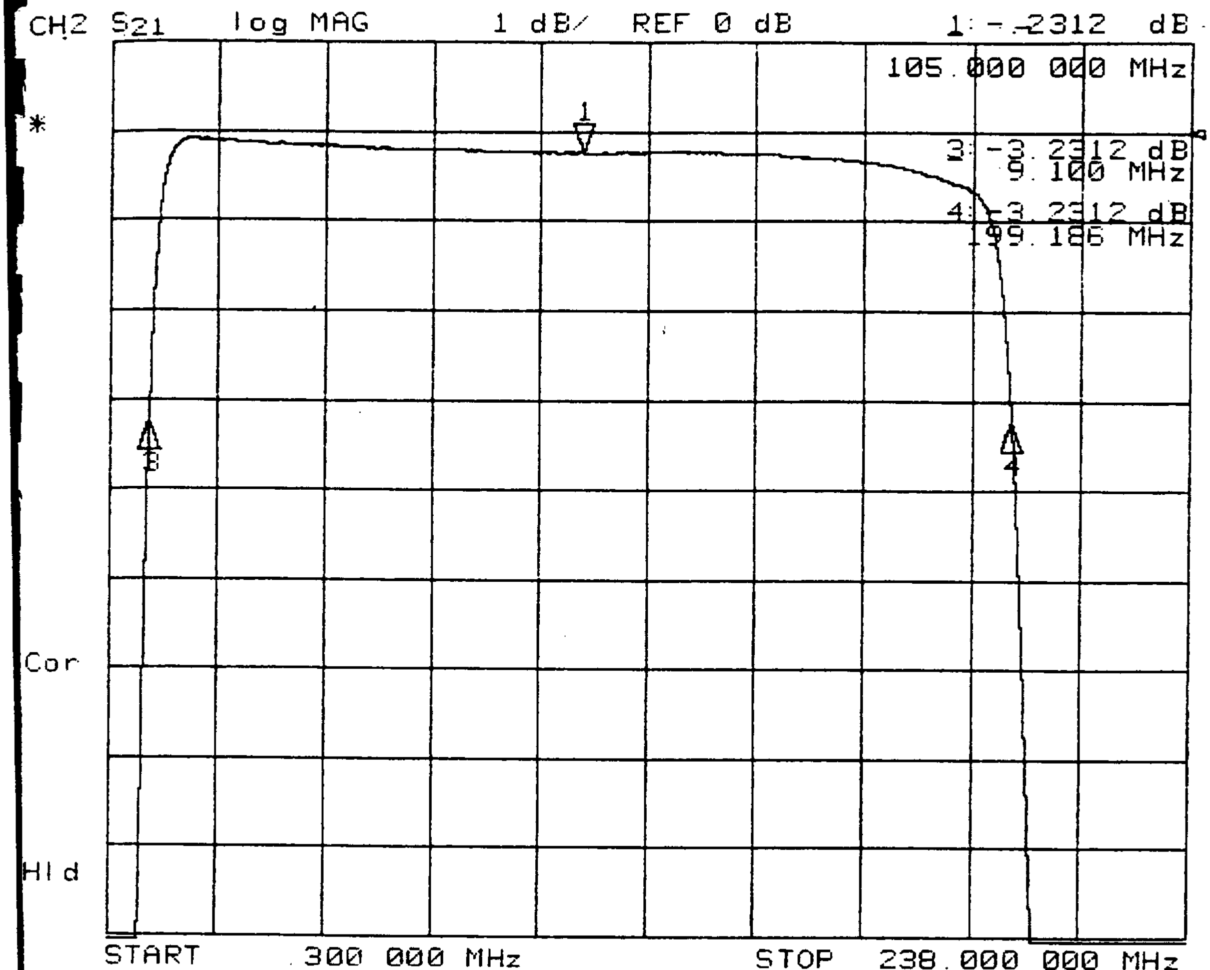
PASSBAND RIPPLE

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	19.32 MHz	18.13 Mhz	19.32 MHz
MIN INSERTION LOSS PERFORMANCE	-0.07 dB	-0.08 dB	-0.08 dB
{11b} 75% BW LOWER BANDEDGE FREQ	13.80 MHz	13.67 Mhz	13.51 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.27 dB	-0.28 dB	-0.30 dB
{11c} 75% BW UPPER BANDEDGE FREQ	156.30 MHz	156.17 Mhz	156.01 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.27 dB	-0.28 dB	-0.30 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.20 dB	0.20 dB	0.22 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.20 dB	0.20 dB	0.22 dB



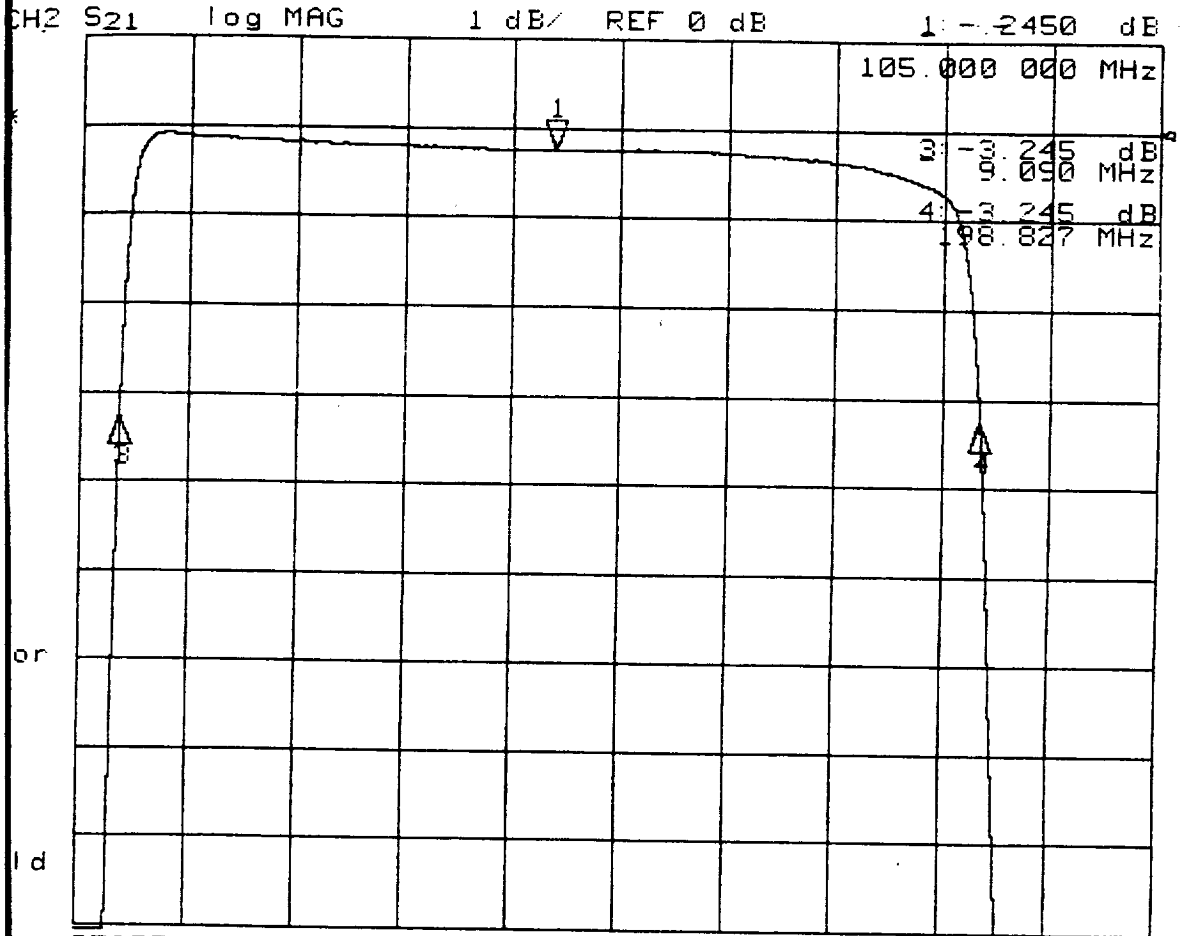
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-019
-10C DATA
OPR: R. HOGGATT DATE DEC 3 0 1996

MARKER PARAMET		annel 2
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.2304 dB
MARKER 2	190.500000 MHz OFF	104.335067 MHz OFF
MARKER 3	33.750000 MHz OFF	9.111437 MHz -3.2304 dB
MARKER 4	176.250000 MHz OFF	199.558698 MHz -3.2304 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-019
+15C DATA
OPR: R. HOGGATT DATE DEC 3 0 1996

MARKER PARAMET		annel 2
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.2312 dB
MARKER 2	190.500000 MHz OFF	104.143618 MHz OFF
MARKER 3	33.750000 MHz OFF	9.100625 MHz -3.2312 dB
MARKER 4	176.250000 MHz OFF	199.186611 MHz -3.2312 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-019
+40C DATA
OPR: R. HOGGATT DATE DEC 30 1996

ARKER PARAMET		annel 2
ARKER 1	19.500000 MHz OFF	105.000000 MHz -.2450 dB
ARKER 2	190.500000 MHz OFF	103.959350 MHz OFF
ARKER 3	33.750000 MHz OFF	9.090897 MHz -3.245 dB
ARKER 4	176.250000 MHz OFF	198.827804 MHz -3.245 dB
R STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
FERENCE MARKER	OFF	OFF
ACEMENT	CONTINUOUS	CONTINUOUS
RKER SEARCH	OFF	OFF
RGET VALUE	-14 dB	-3 dB
RKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
RKER TRACKING	OFF	OFF

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-019
AEROJET 1331559-2 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	PASS/FAIL (PASS circled)	PASS/FAIL (PASS circled)	PASS/FAIL (PASS circled)
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=105.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-59.1 dB (40.0 dB MIN)	-59.1 dB (40.0 dB MIN)	-59.0 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 228.5 MHz TO 1000.0 MHz	-42.1 dB (40.0 dB MIN)	-42.1 dB (40.0 dB MIN)	-42.1 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-13.5 °C (-15.0 TO -10.0)	+15.4 °C (12.5 TO 17.5)	+44.4 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

DA 5

TEST PERFORMED BY R. Hoggatt DATE 12/30/96

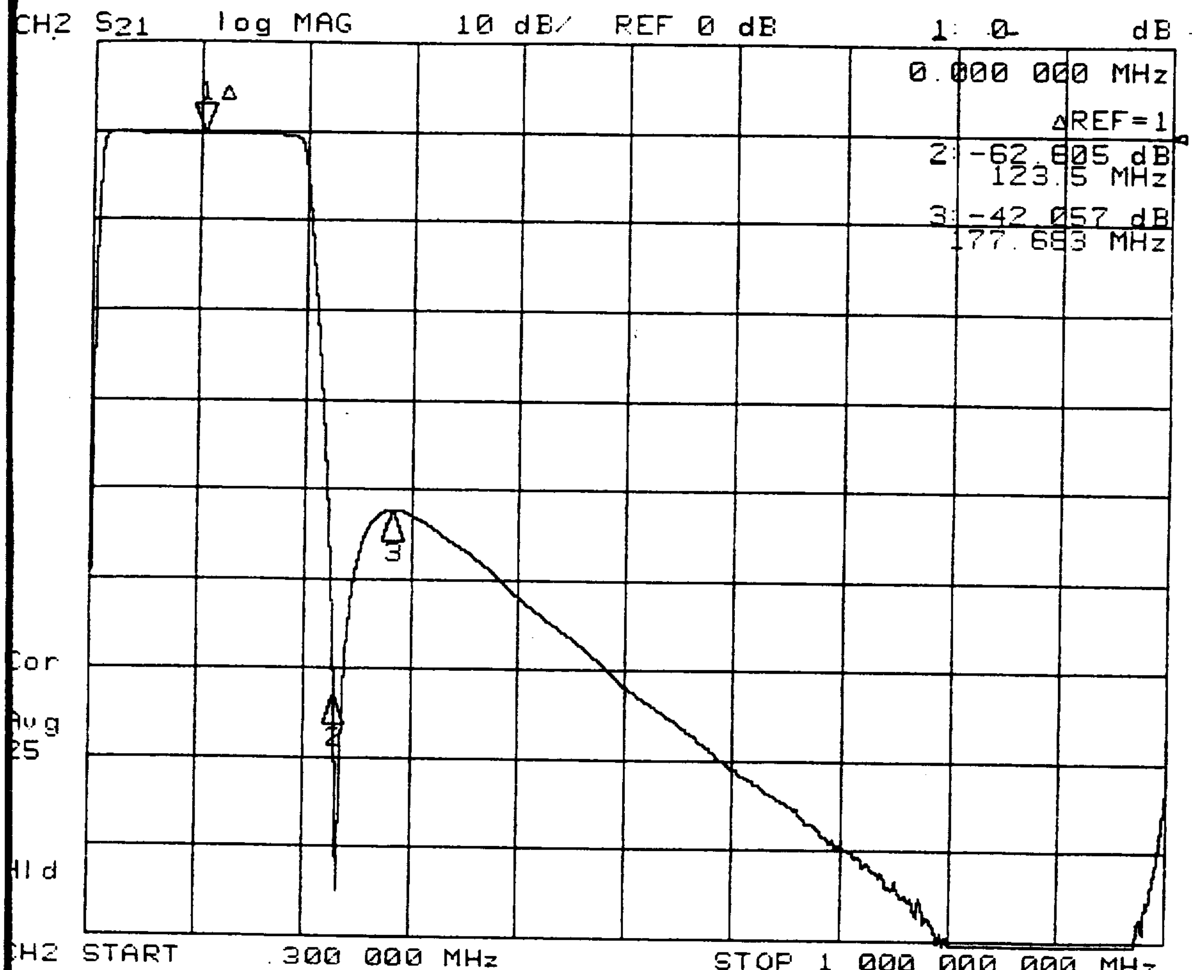
NOTE IF TEST WITNESSED BY AESD: ________ GSI: _ Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

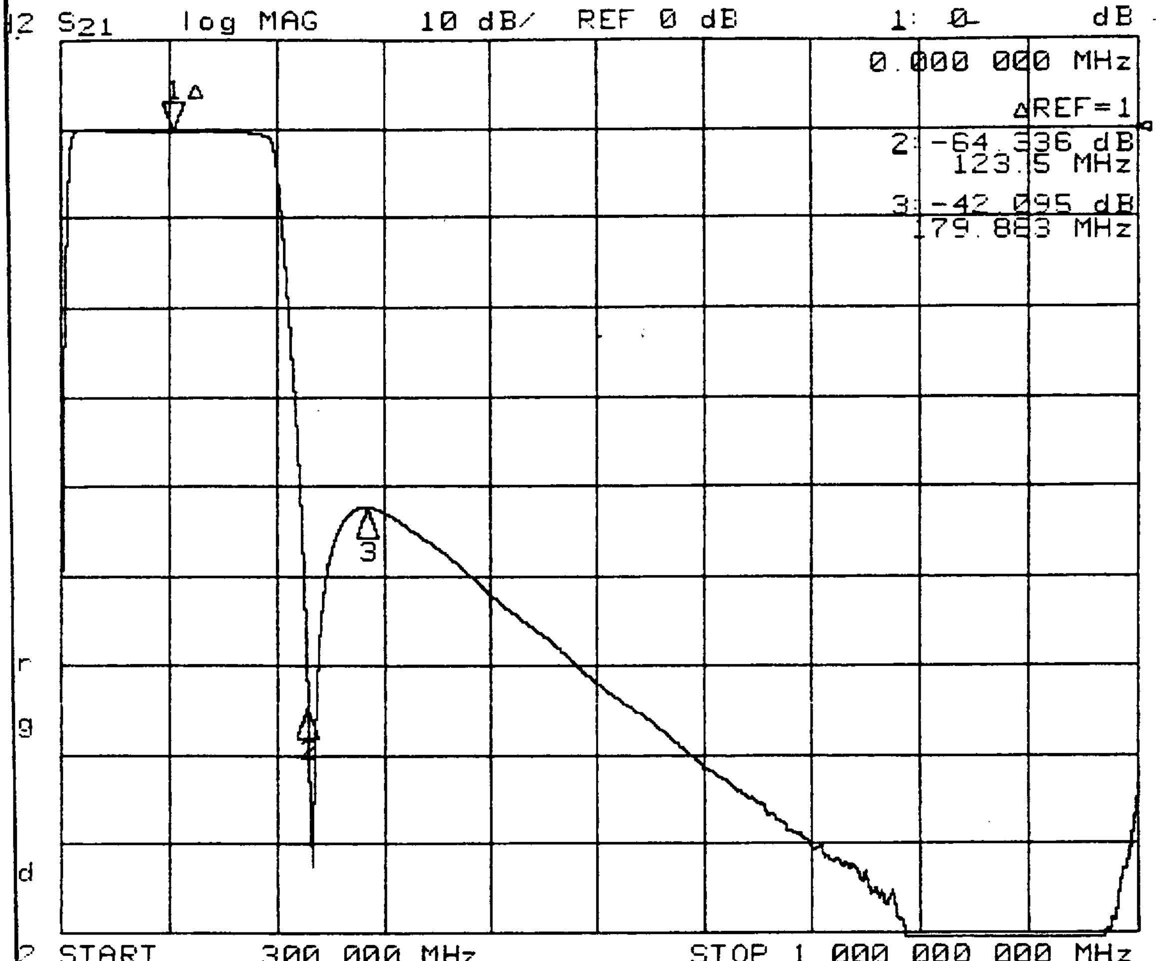
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.501
MOUNTING HOLE CENTER	0.125 ± .010	0.126
BETWEEN UPPER MOUNTING HOLES	$\boxed{3.250}$	3.251
BETWEEN LOWER MOUNTING HOLES	$\boxed{3.250}$	3.250



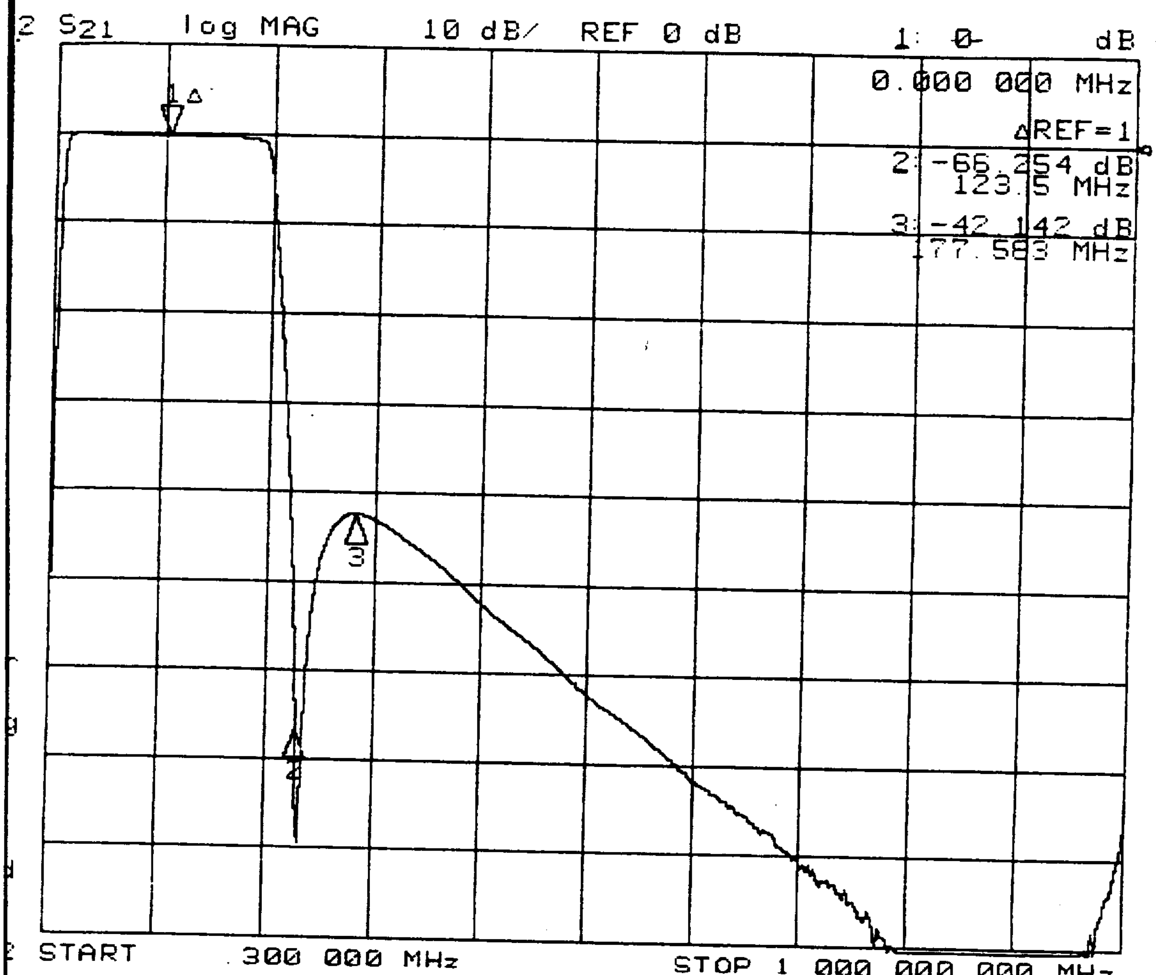
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-019
-10C DATA
OPR: R. HOGGATT DATE DEC 30 1996

ARKER PARAME		annel 2
ARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
ARKER 2	5.000000 MHz OFF	228.500000 MHz -62.605 dB
ARKER 3	5.000000 MHz OFF	282.683742 MHz -42.057 dB
ARKER 4	5.000000 MHz OFF	.300000 MHz OFF
KR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
EFERENCE MARKER	OFF	MARKER 1
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-3 dB	-3 dB
ARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
ARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-019
+15C DATA
OPR: R. HOGGATT DATE DEC 3 0 1996

RKER PARAME		annel 2
RKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
RKER 2	5.000000 MHz OFF	228.500000 MHz -64.336 dB
RKER 3	5.000000 MHz OFF	284.883082 MHz -42.095 dB
RKER 4	5.000000 MHz OFF	.300000 MHz OFF
R STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
ERENCE MARKER	OFF	MARKER 1
ACEMENT	CONTINUOUS	CONTINUOUS
RKER SEARCH	OFF	OFF
RGET VALUE	-3 dB	-3 dB
RKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
RKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-019
+40C DATA
OPR: R. HOGGATT DATE DEC 30 1996

RKER PARAMET		annel 2
RKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
RKER 2	5.000000 MHz OFF	228.500000 MHz -66.254 dB
RKER 3	5.000000 MHz OFF	282.583772 MHz -42.142 dB
KER 4	5.000000 MHz OFF	.300000 MHz OFF
STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
ERENCE MARKER	OFF	MARKER 1
CEMENT	CONTINUOUS	CONTINUOUS
KER SEARCH	OFF	OFF
GET VALUE	-3 dB	-3 dB
KER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
KER TRACKING	OFF	OFF

APPENDIX B **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-019
AEROJET 1331559-2 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.1 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-82.6 dB	F11	(*) 130.0	MHz	-0.23 dB
F2	1.0	MHz	-66.2 dB	F12	(*) 150.0	MHz	-0.27 dB
F3	5.0	MHz	-17.6 dB	F13	180.0	MHz	-0.46 dB
F4	7.5	MHz	-7.31 dB	F14	190.0	MHz	-0.65 dB
F5	10.0	MHz	-1.76 dB	F15	200.0	MHz	-4.10 dB
F6	20.0	MHz	-0.08 dB	F16	250.0	MHz	-47.6 dB
F7	40.0	MHz	-0.11 dB	F17	300.0	MHz	-42.9 dB
F8	(*) 60.0	MHz	-0.17 dB	F18	400.0	MHz	-52.0 dB
F9	(*) 80.0	MHz	-0.20 dB	F19	500.0	MHz	-62.0 dB
F10	105.0	MHz	-0.23 dB	F20	1000.0	MHz	-76.6 dB

DM 5

TEST PERFORMED BY: R. Hoggatt DATE 12/27/96

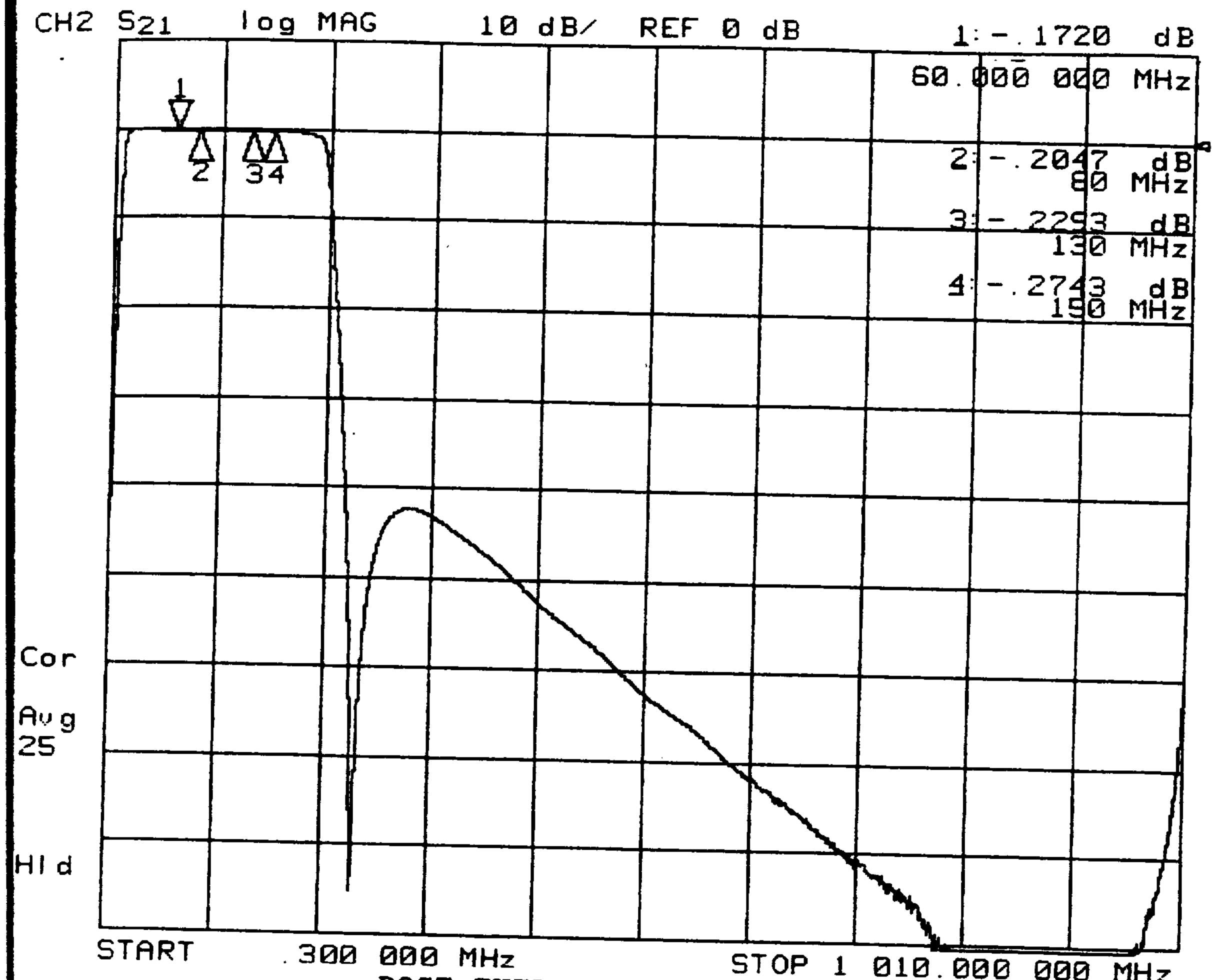
NOTE IF TEST WITNESSED BY AESD__________ GSI _ Not witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX B PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P228-019
AMBIENT
OPR: R. HOGGATT DATE DEC 27 1996

MARKER PARAME		annel 2
MARKER 1	17.750000 MHz OFF	60.000000 MHz -.1720 dB
MARKER 2	157.250000 MHz OFF	80.000000 MHz -.2047 dB
MARKER 3	29.375000 MHz OFF	130.000000 MHz -.2293 dB
MARKER 4	145.625000 MHz OFF	150.000000 MHz -.2743 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
ARKER TRACKING	OFF	OFF

Report No. 11491
June 1999

Channel 8 Bandpass Filter

IF Filter (S/N: 1331559-4, S/N: P230-014)

ACCEPTANCE TEST REPORT

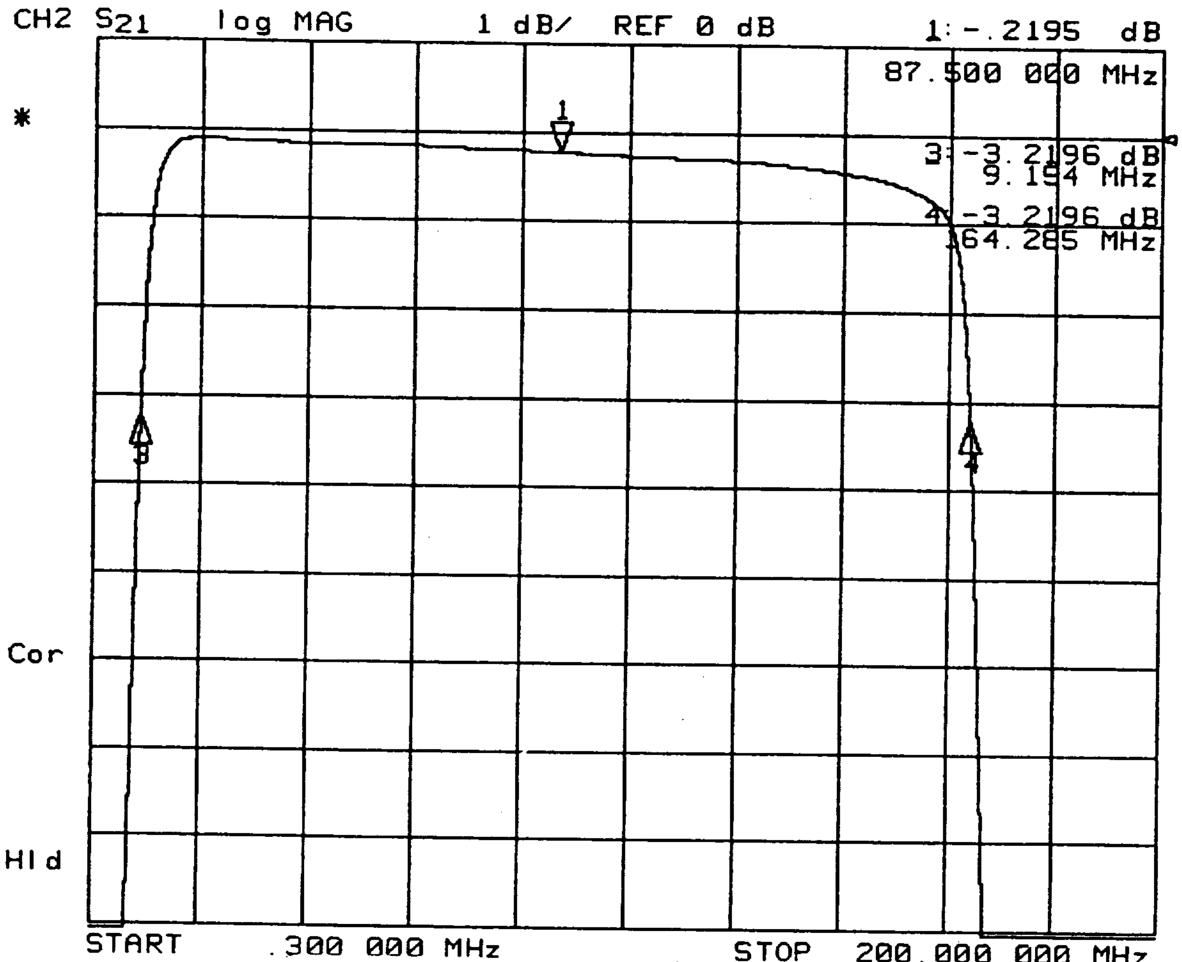
BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-014
AEROJET 1331559-4 REV. E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	164.29 MHz (163.0-165.0)	164.02 Mhz (163.0-165.0)	163.75 MHz (163.0-165.0)
{8} LOWER 3.0 dB BANDEDGE	9.15 MHz (8.0-10.0)	9.14 Mhz (8.0-10.0)	9.12 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	155.14 MHz (153.0-157.0)	154.88 Mhz (153.0-157.0)	154.63 MHz (153.0-157.0)
{10} ADD {7} AND {8} ÷ 2 =	86.72 MHz (87.5 NOM)	86.58 MHz (87.5 NOM)	86.44 Mhz (87.5 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.5 °C (-15.0 TO -10.0)	+15.1 °C (12.5 TO 17.5)	+42.5 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

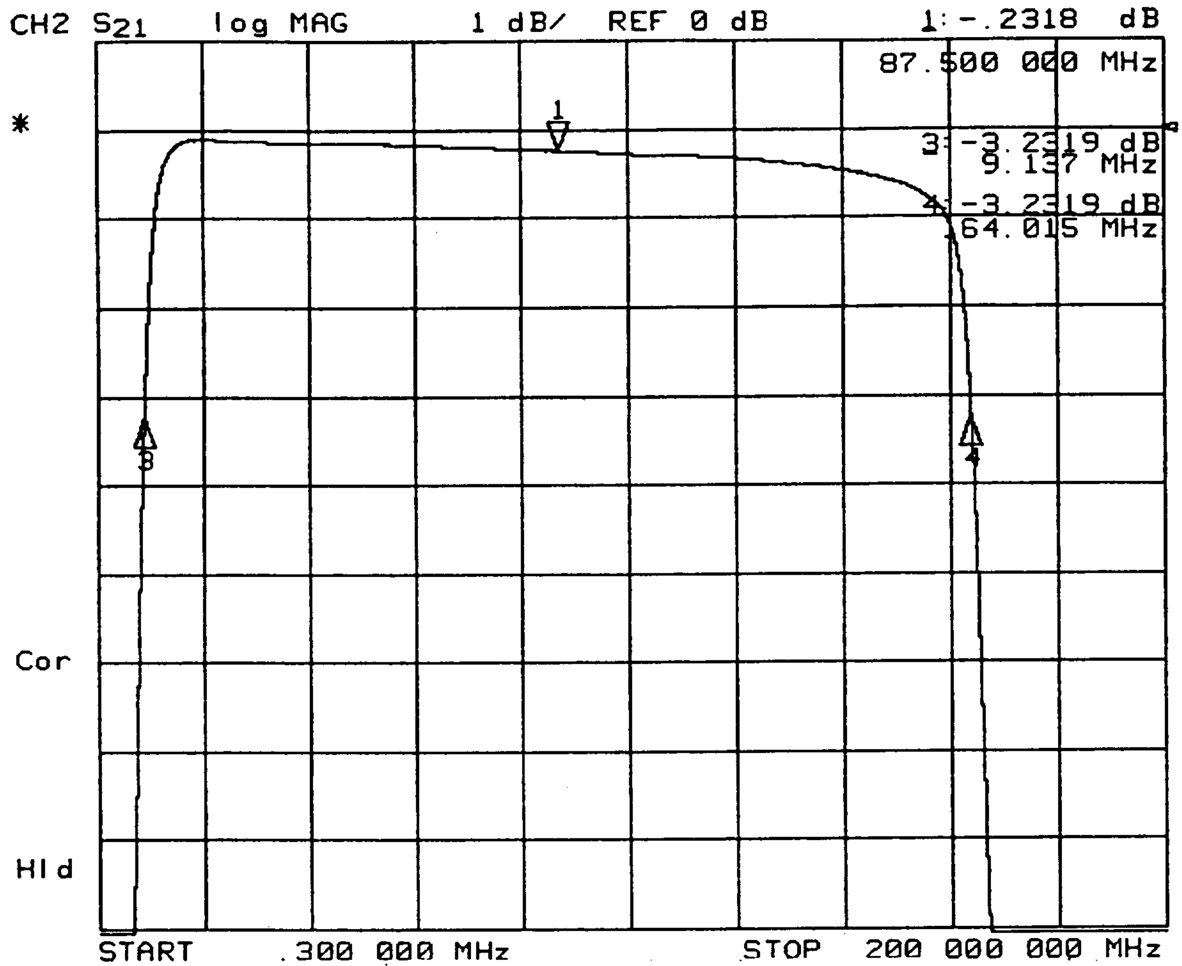
PASSBAND RIPPLE

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	19.27 MHz	21.26 Mhz	19.77 MHz
MIN INSERTION LOSS PERFORMANCE	-0.10 dB	-0.10 dB	-0.11 dB
{11b} 75% BW LOWER BANDEDGE FREQ	13.29 MHz	13.15 Mhz	13.05 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.35 dB	-0.37 dB	-0.39 dB
{11c} 75% BW UPPER BANDEDGE FREQ	129.54 MHz	129.40 Mhz	129.30 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.35 dB	-0.37 dB	-0.39 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.25 dB	0.27 dB	0.28 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.25 dB	0.27 dB	0.28 dB



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-014
-10C DATA
OPR: R. HOGGATT DATE DEC 2 0 1996

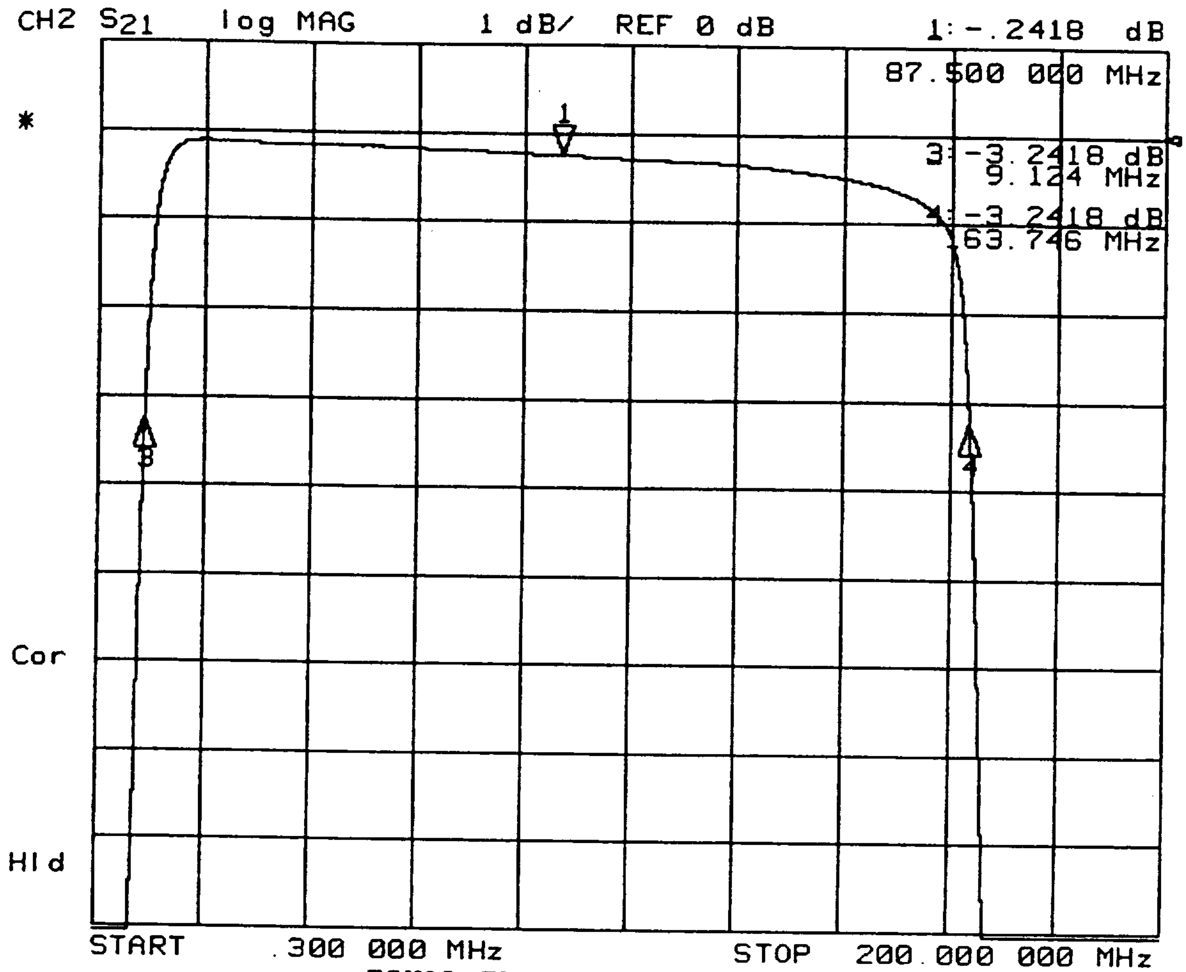
MARKER PARAMET		annel 2
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2195 dB
MARKER 2	157.250000 MHz OFF	86.720252 MHz OFF
MARKER 3	29.375000 MHz OFF	9.154920 MHz -3.2196 dB
MARKER 4	145.625000 MHz OFF	164.285585 MHz -3.2196 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-014
+15C DATA

MARKER PARAMET OPR: R. HOGGATT DATE DEC 20 1996 annel 2

MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2318 dB
MARKER 2	157.250000 MHz OFF	86.576516 MHz OFF
MARKER 3	29.375000 MHz OFF	9.137909 MHz -3.2319 dB
MARKER 4	145.625000 MHz OFF	164.015124 MHz -3.2319 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-014
+40C DATA
OPR: R. HOGGATT DATE DEC 2 0 1996

MARKER PARAME- annel 2

MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2418 dB
MARKER 2	157.250000 MHz OFF	86.435518 MHz OFF
MARKER 3	29.375000 MHz OFF	9.124221 MHz -3.2418 dB
MARKER 4	145.625000 MHz OFF	163.746815 MHz -3.2418 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-014
AEROJET 1331559-4 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	PASS/FAIL	PASS/FAIL	PASS/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=87.5 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-60.5 dB (40.0 dB MIN)	-60.4 dB (40.0 dB MIN)	-60.4 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 188.25 MHz TO 1000.0 MHz	-62.1 dB (40.0 dB MIN)	-63.1 dB (40.0 dB MIN)	-64.1 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-12.5 °C (-15.0 TO -10.0)	+15.1 °C (12.5 TO 17.5)	+42.7 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

DA 5

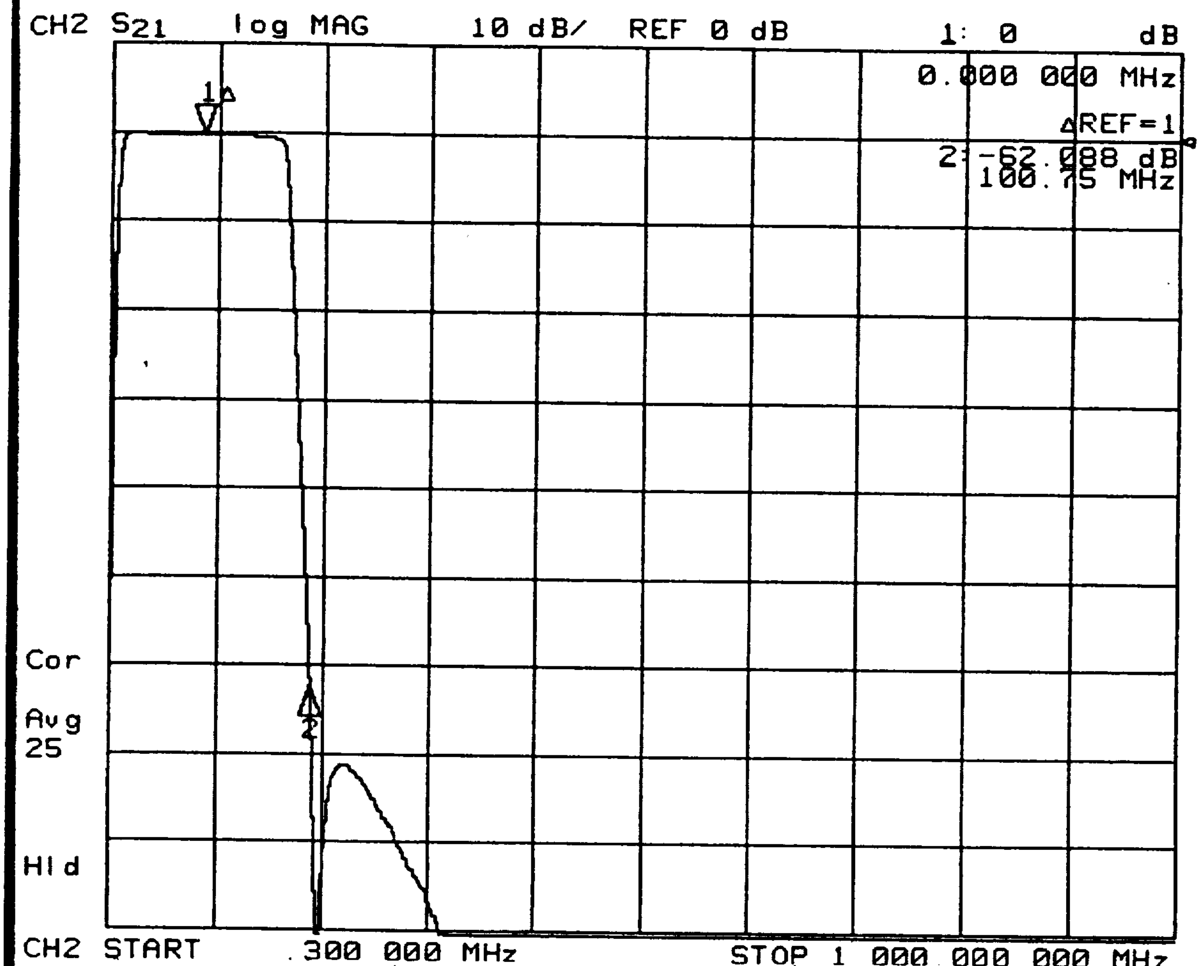
TEST PERFORMED BY R. Hoggatt DATE 12/20/96

NOTE IF TEST WITNESSED BY AESD: Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.501
MOUNTING HOLE CENTER	0.125 ± .010	0.125
BETWEEN UPPER MOUNTING HOLES	$\boxed{3.250}$	3.251
BETWEEN LOWER MOUNTING HOLES	$\boxed{3.250}$	3.251



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-014
-10C DATA

MARKER PARAMET OPR: R. HOGGATT DATE DEC 2 0 1996 annel 2

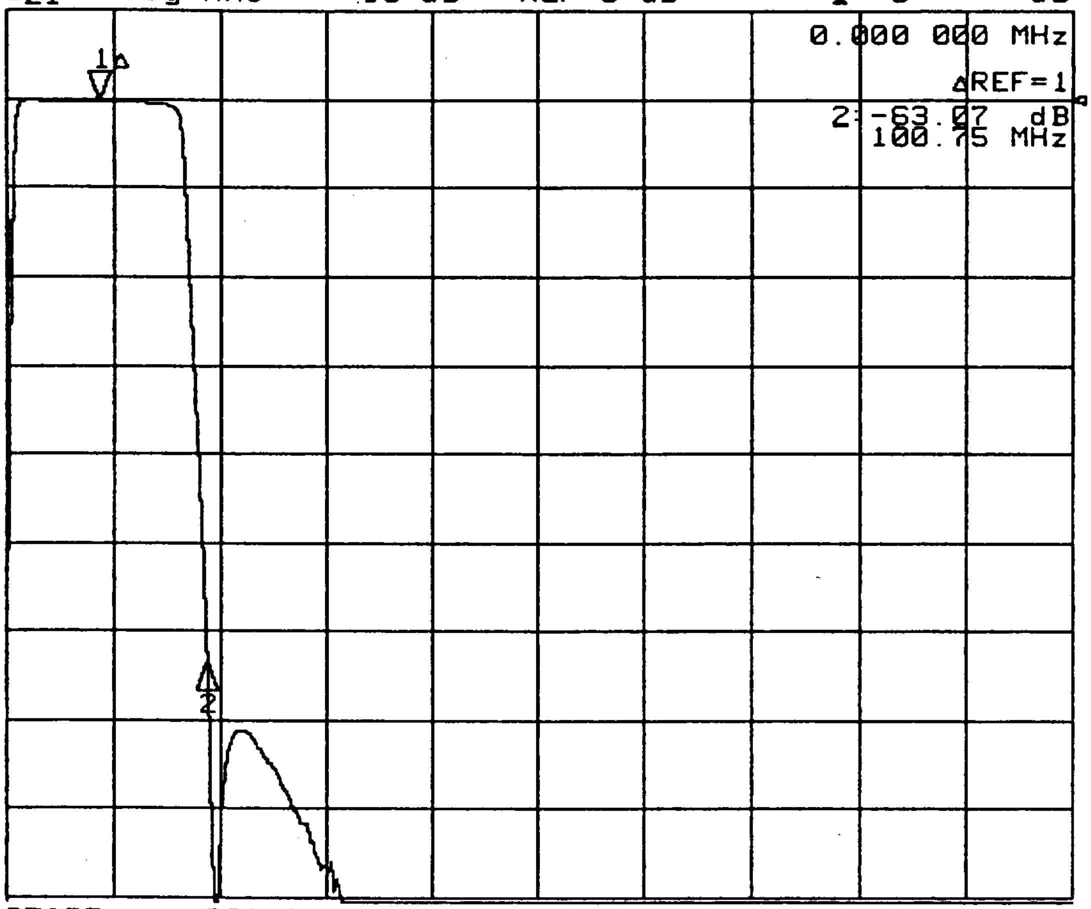
MARKER 1	1.000000 MHz OFF	87.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	188.250000 MHz -62.088 dB
MARKER 3	5.000000 MHz OFF	188.250000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

CH2 S_{21} log MAG 10 dB/ REF 0 dB 1: 0 dB

Cor

Avg
25

Hld



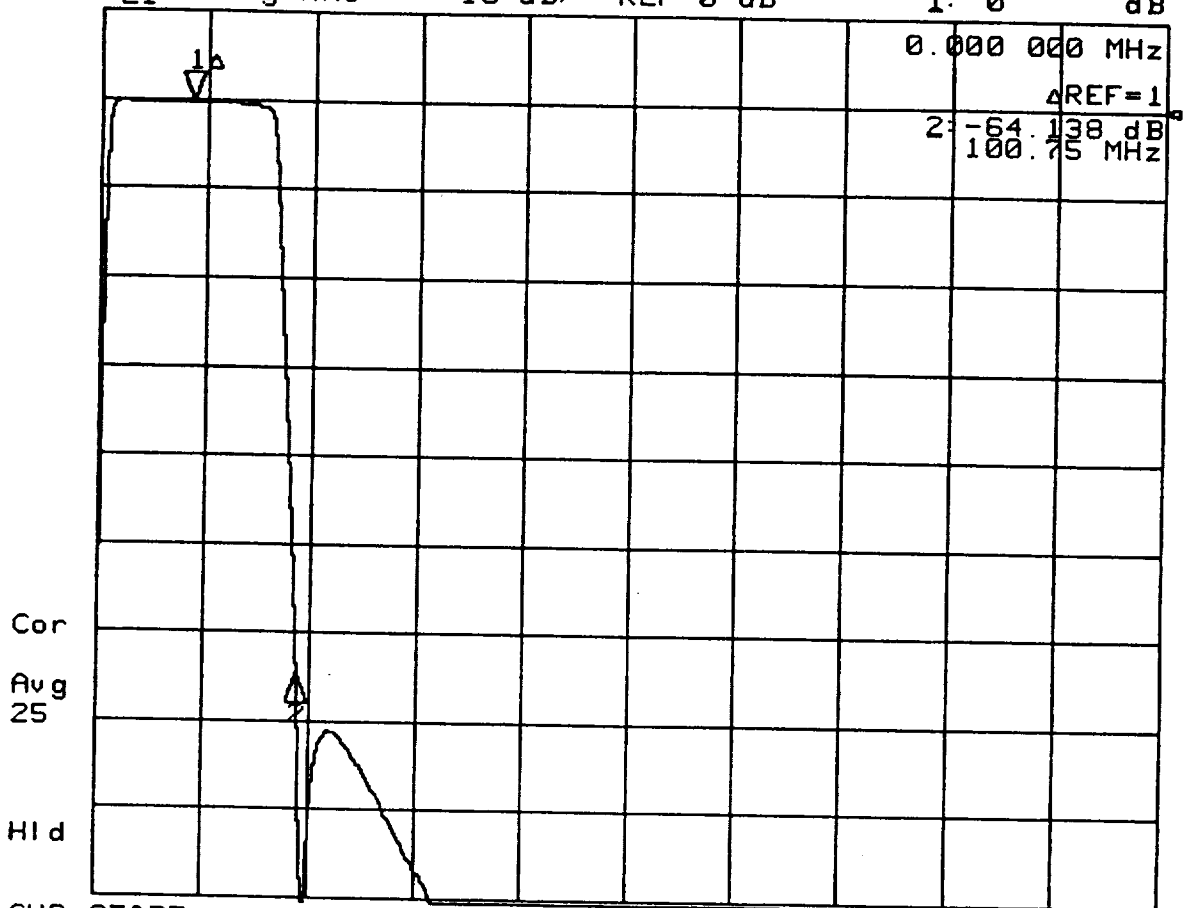
CH2 START .300 000 MHz STOP 1 000.000 000 MHz

FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-014
+15C DATA
OPR: R. HOGGATT DATE DEC 20 1996

MARKER PARAME annel 2

MARKER 1	1.000000 MHz OFF	87.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	188.250000 MHz -63.07 dB
MARKER 3	5.000000 MHz OFF	188.250000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

CH2 S_{21} log MAG 10 dB/ REF 0 dB 1: 0 dB



CH2 START .300 000 MHz STOP 1 000 000 000 MHz

FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-014
+40C DATA
OPR: R. HOGGATT DATE DEC 2 0 1996

MARKER PARAMET		innel 2
MARKER 1	1.000000 MHz OFF	87.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	188.250000 MHz -64.138 dB
MARKER 3	5.000000 MHz OFF	188.250000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-014
AEROJET 1331559-4 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +23.1 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-84.3 dB	F11	(*) 100.0	MHz	-0.27 dB
F2	1.0	MHz	-67.7 dB	F12	(*) 125.0	MHz	-0.33 dB
F3	5.0	MHz	-18.6 dB	F13	150.0	MHz	-0.60 dB
F4	7.5	MHz	-7.63 dB	F14	160.0	MHz	-1.08 dB
F5	10.0	MHz	-1.80 dB	F15	165.0	MHz	-4.63 dB
F6	15.0	MHz	-0.22 dB	F16	170.0	MHz	-16.1 dB
F7	25.0	MHz	-0.12 dB	F17	200.0	MHz	-83.0 dB
F8	(*) 50.0	MHz	-0.16 dB	F18	300.0	MHz	-86.3 dB
F9	(*) 75.0	MHz	-0.20 dB	F19	500.0	MHz	-109.0 dB
F10	87.5	MHz	-0.23 dB	F20	1000.0	MHz	-108.8 dB

TEST PERFORMED BY: R. Hoggatt DA 5 DATE 12/20/96

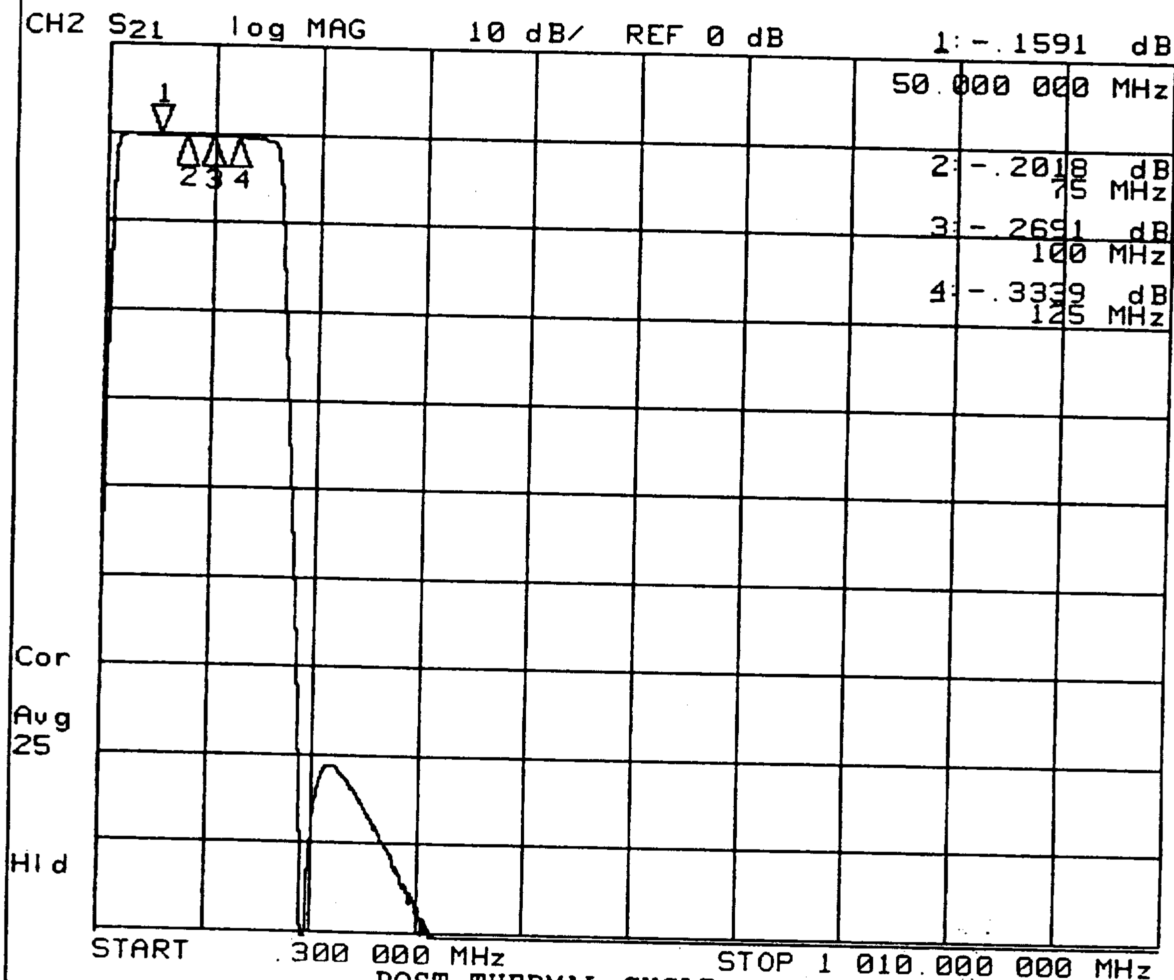
NOTE IF TEST WITNESSED BY AESD Not witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX D PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a .) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
b.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
c.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.
d) INSERTION LOSS PER ATP PARA 4.5.2
e) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) VSWR PER ATP PARA 4.5.1.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P230-014
AMBIENT

MARKER PARAMET	OPR: R. HOGGATT DATE DEC 2 0 1996	annel 2
MARKER 1	17.750000 MHz OFF	50.000000 MHz -.1591 dB
MARKER 2	157.250000 MHz OFF	75.000000 MHz -.2018 dB
MARKER 3	29.375000 MHz OFF	100.000000 MHz -.2691 dB
MARKER 4	145.625000 MHz OFF	125.000000 MHz -.3339 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Report No. 11491
June 1999

Channel 9 Bandpass Filter

IF Filter (S/N: 1331559-4, S/N: P230-015)

APPENDIX D **ACCEPTANCE TEST REPORT**

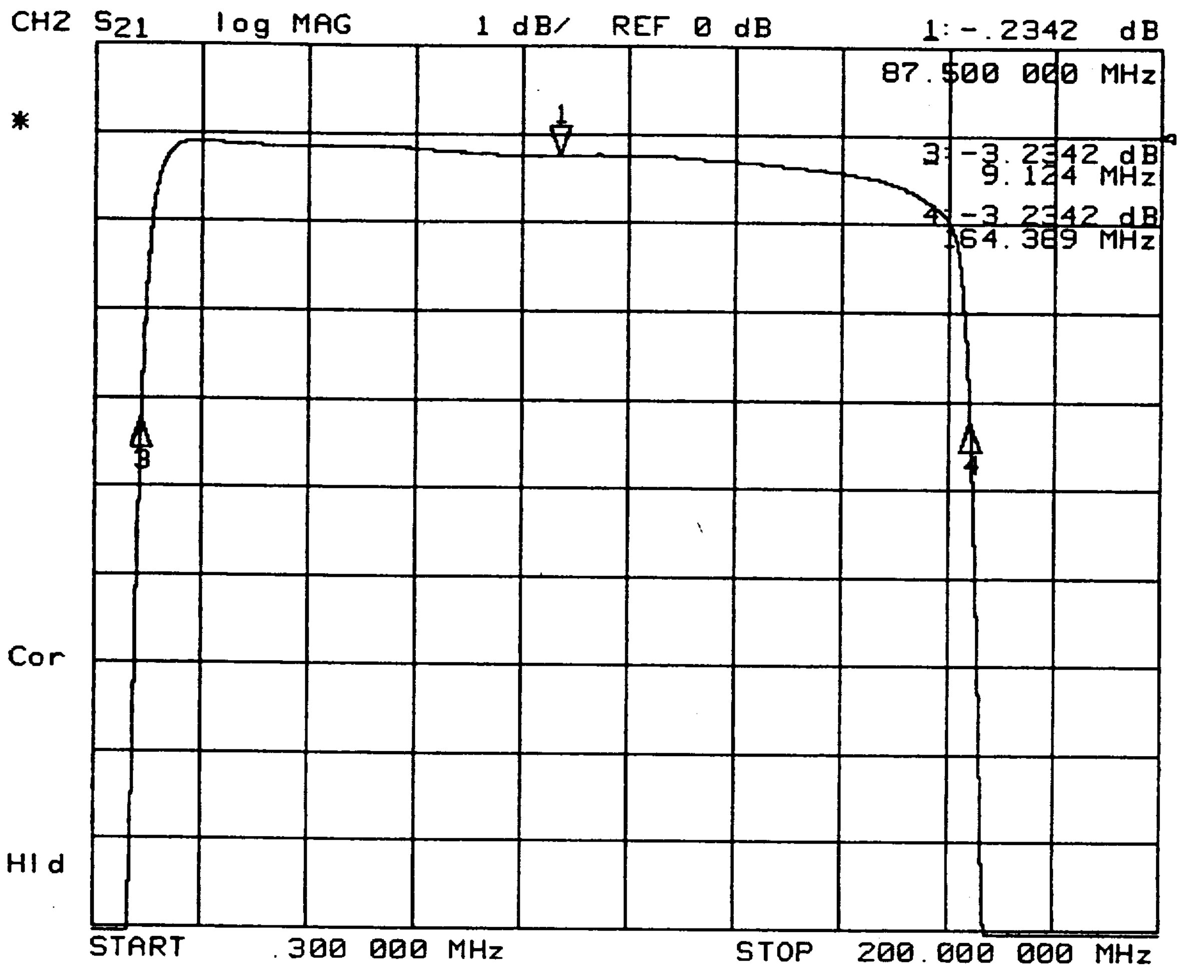
BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-015
AEROJET 1331559-4 REV. E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	164.37 MHz (163.0-165.0)	164.15 Mhz (163.0-165.0)	163.93 MHz (163.0-165.0)
{8} LOWER 3.0 dB BANDEDGE	9.12 MHz (8.0-10.0)	9.11 Mhz (8.0-10.0)	9.10 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	155.25 MHz (153.0-157.0)	155.04 Mhz (153.0-157.0)	154.83 MHz (153.0-157.0)
{10} ADD {7} AND {8} ÷ 2 =	86.75 MHz (87.5 NOM)	86.63 MHz (87.5 NOM)	86.52 Mhz (87.5 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.0 °C (-15.0 TO -10.0)	+16.2 °C (12.5 TO 17.5)	+42.6 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

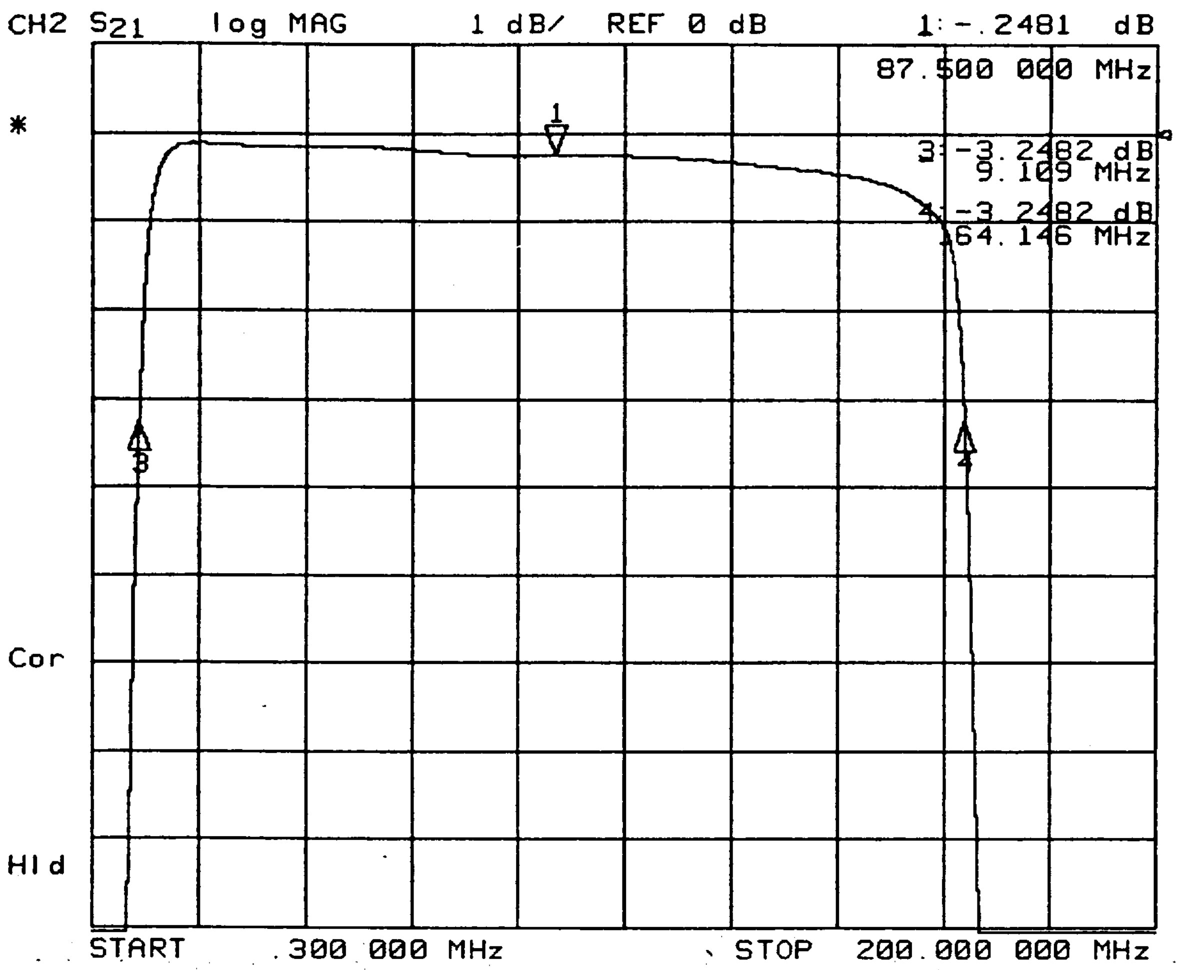
PASSBAND RIPPLE

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	20.77 MHz	19.27 Mhz	19.27 MHz
MIN INSERTION LOSS PERFORMANCE	-0.10 dB	-0.10 dB	-0.11 dB
{11b} 75% BW LOWER BANDEDGE FREQ	13.28 MHz	13.14 Mhz	13.04 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.35 dB	-0.38 dB	-0.40 dB
{11c} 75% BW UPPER BANDEDGE FREQ	129.53 MHz	129.39 Mhz	129.29 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.35 dB	-0.38 dB	-0.40 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.25 dB	0.28 dB	0.29 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.25 dB	0.28 dB	0.29 dB



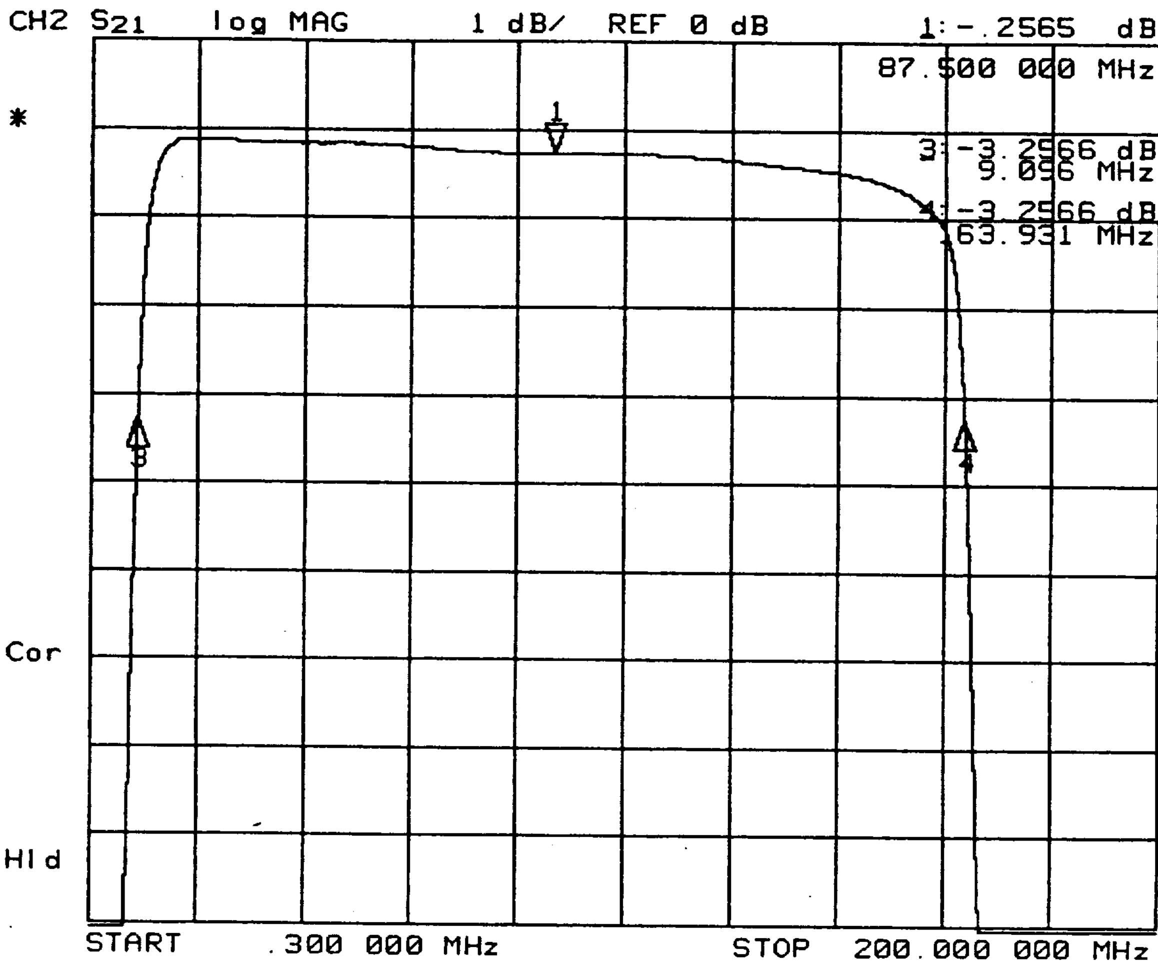
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-015
-10C DATA
OPR: R. HOGGATT DATE DEC 2 1 1996

MARKER PARAMET		ınnel 2
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2342 dB
MARKER 2	157.250000 MHz OFF	86.747113 MHz OFF
MARKER 3	29.375000 MHz OFF	9.124681 MHz -3.2342 dB
MARKER 4	145.625000 MHz OFF	164.369546 MHz -3.2342 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-015
+15C DATA
OPR: R. HOGGATT DATE DEC 2 1 1996

MARKER PARAMET		innel 2
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2481 dB
MARKER 2	157.250000 MHz OFF	86.627848 MHz OFF
MARKER 3	29.375000 MHz OFF	9.109523 MHz -3.2482 dB
MARKER 4	145.625000 MHz OFF	164.146173 MHz -3.2482 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-015
+40C DATA
OPR: R. HOGGATT DATE DEC 2 1 1996

MARKER PARAMET		annel 2
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2565 dB
MARKER 2	157.250000 MHz OFF	86.513946 MHz OFF
MARKER 3	29.375000 MHz OFF	9.096180 MHz -3.2566 dB
MARKER 4	145.625000 MHz OFF	163.931712 MHz -3.2566 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

APPENDIX D — **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-015
AEROJET 1331559-4 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	PASS/FAIL	PASS/FAIL	PASS/FAIL
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=87.5 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-60.5 dB (40.0 dB MIN)	-60.5 dB (40.0 dB MIN)	-60.4 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 188.25 MHz TO 1000.0 MHz	-70.7 dB (40.0 dB MIN)	-70.6 dB (40.0 dB MIN)	-70.8 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-12.1 °C (-15.0 TO -10.0)	+16.1 °C (12.5 TO 17.5)	+42.8 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

TEST PERFORMED BY R. Hoggatt DA 5 DATE 12/21/96

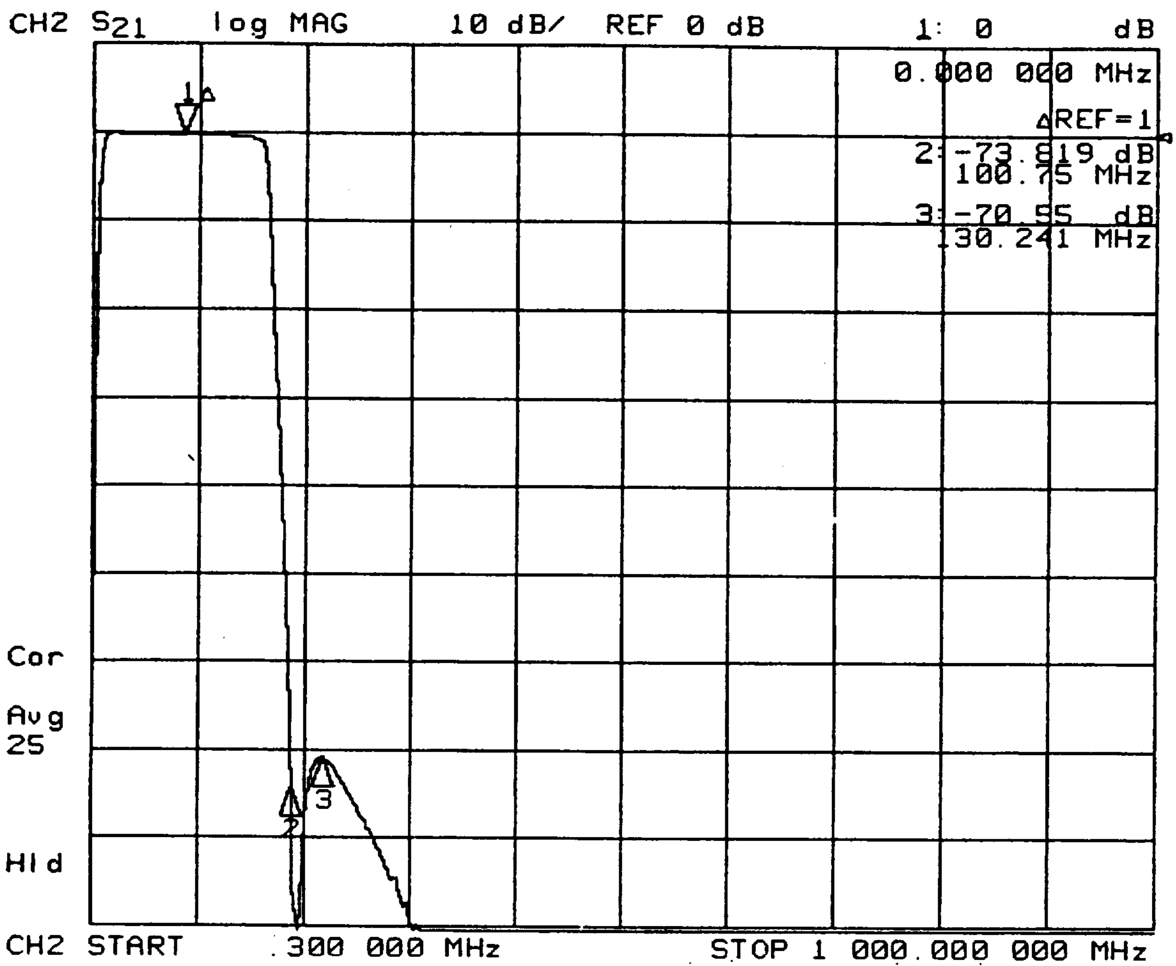
NOTE IF TEST WITNESSED BY AESD: Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

{16} REFERENCE CUSTOMER DRAWING 1331559

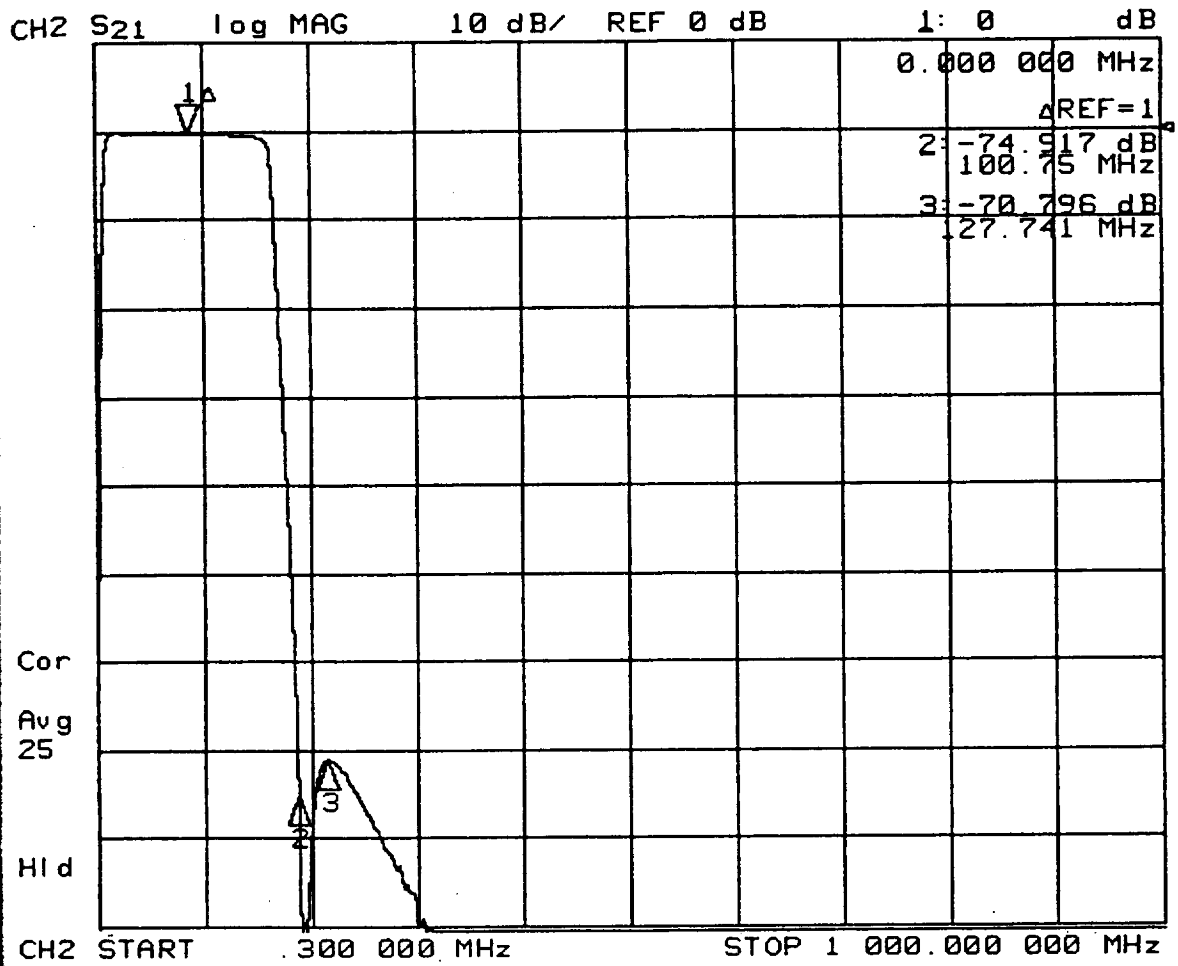
DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.502 JC
MOUNTING HOLE CENTER	0.125 ± .010	0.125
BETWEEN UPPER MOUNTING HOLES	$\boxed{3.250}$	3.249
BETWEEN LOWER MOUNTING HOLES	$\boxed{3.250}$	3.249



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-015
+15C DATA

MARKER PARAMETI OPR: R. HOGGATT DATE DEC 2 1 1996 innel 2

MARKER 1	1.000000 MHz OFF	87.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	188.250000 MHz -73.819 dB
MARKER 3	5.000000 MHz OFF	217.741146 MHz -70.55 dB
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-015
+40C DATA

MARKER PARAME1 OPR: R. HOGGATT DATE DEC 2 1 1996 annel 2

MARKER 1	1.000000 MHz OFF	87.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	188.250000 MHz -74.917 dB
MARKER 3	5.000000 MHz OFF	215.241900 MHz -70.796 dB
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-015
AEROJET 1331559-4 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT

PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +23.2 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-83.9 dB	F11	(*) 100.0	MHz	-0.24 dB
F2	1.0	MHz	-67.5 dB	F12	(*) 125.0	MHz	-0.34 dB
F3	5.0	MHz	-18.6 dB	F13	150.0	MHz	-0.59 dB
F4	7.5	MHz	-7.58 dB	F14	160.0	MHz	-1.04 dB
F5	10.0	MHz	-1.77 dB	F15	165.0	MHz	-4.72 dB
F6	15.0	MHz	-0.22 dB	F16	170.0	MHz	-17.6 dB
F7	25.0	MHz	-0.12 dB	F17	200.0	MHz	-79.8 dB
F8	(*) 50.0	MHz	-0.17 dB	F18	300.0	MHz	-88.4 dB
F9	(*) 75.0	MHz	-0.24 dB	F19	500.0	MHz	-100.0 dB
F10	87.5	MHz	-0.25 dB	F20	1000.0	MHz	-103.6 dB

TEST PERFORMED BY: R. Hoggatt DA 5 DATE 12/21/96

NOTE IF TEST WITNESSED BY AESD Not witnessed this time. DLD

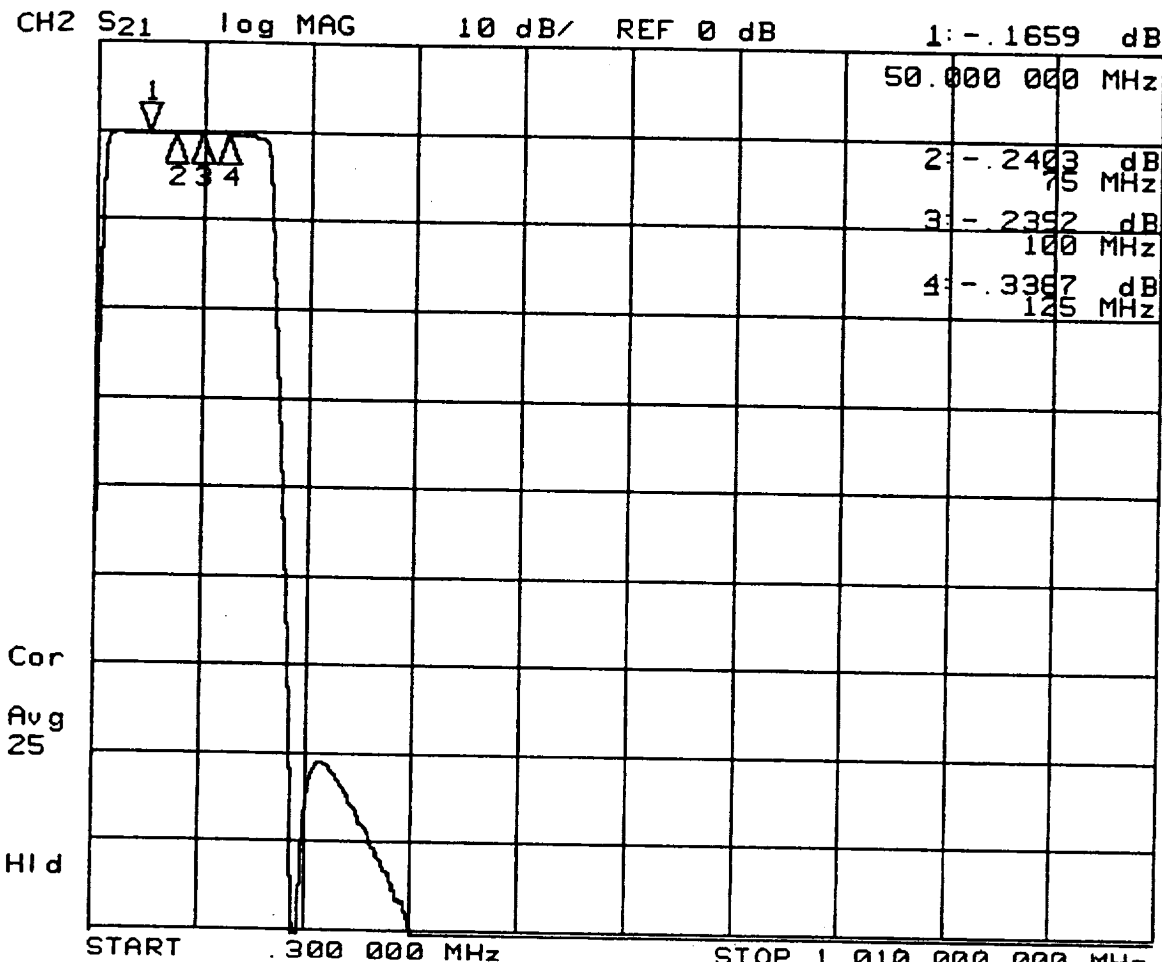
***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST

ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX D PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a .) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
b.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
c.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.
d) INSERTION LOSS PER ATP PARA 4.5.2
e) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) VSWR PER ATP PARA 4.5.1.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P230-015
AMBIENT
OPR: R. HOGGATT DATE DEC 2 1 1996

MARKER PARAMET ... annel 2

MARKER 1	17.750000 MHz OFF	50.000000 MHz -.1659 dB
MARKER 2	157.250000 MHz OFF	75.000000 MHz -.2403 dB
MARKER 3	29.375000 MHz OFF	100.000000 MHz -.2392 dB
MARKER 4	145.625000 MHz OFF	125.000000 MHz -.3367 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Report No. 11491
June 1999

Channel 10 Bandpass Filter

IF Filter (S/N: 1331559-7, S/N: P233-009)

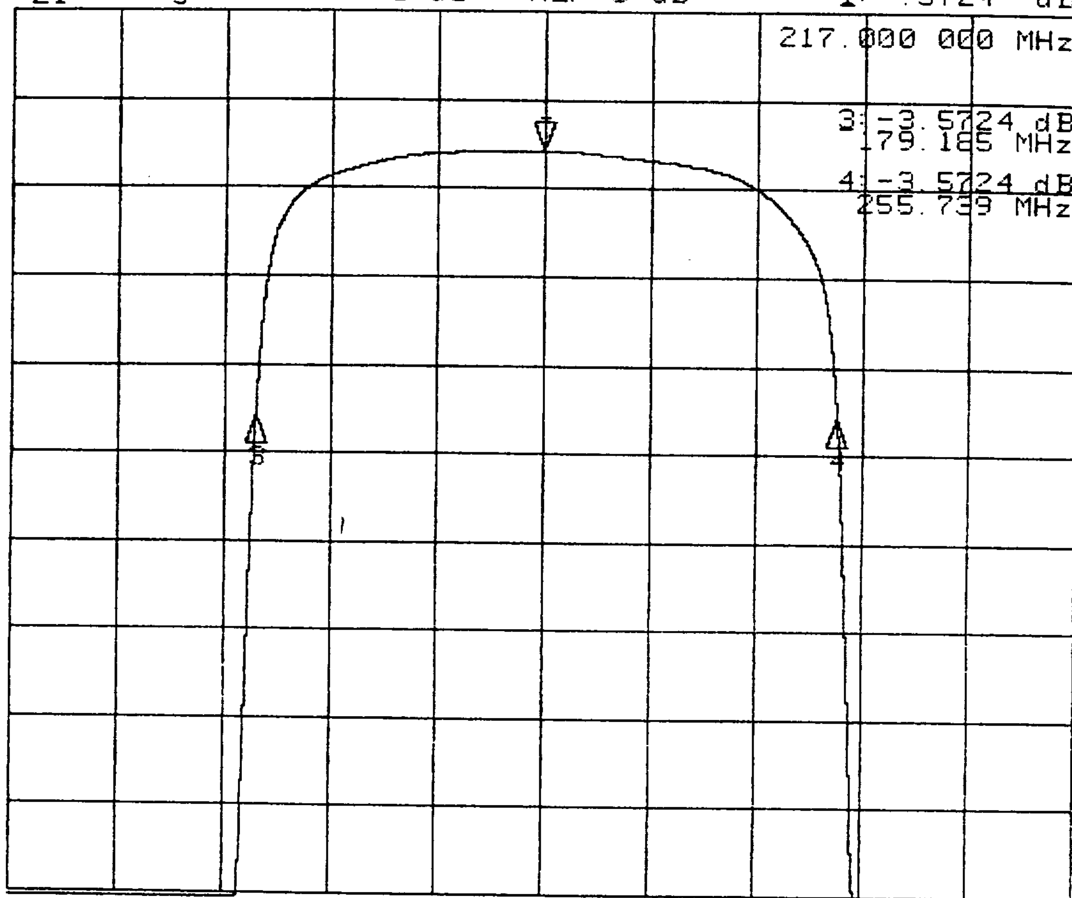
APPENDIX G ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL FX217-78-10SS1 S/N P233-009
AEROJET 1331559-7 REV. E

3.0 dB BANDWIDTH ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	255.74 MHz (254.0-256.0)	255.34 Mhz (254.0-256.0)	254.95 MHz (254.0-256.0)
{8} LOWER 3.0 dB BANDEDGE	179.19 MHz (178.0-180.0)	179.01 Mhz (178.0-180.0)	178.84 MHz (178.0-180.0)
{9} 3.0 dB RELATIVE BANDWIDTH	76.55 MHz (74.0-78.0)	76.33 Mhz (74.0-78.0)	76.11 MHz (74.0-78.0)
{10} ADD {7} AND {8} ÷ 2 =	217.47 MHz (217.0 NOM)	217.18 MHz (217.0 NOM)	216.90 Mhz (217.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.5 °C (-15.0 TO -10.0)	+15.9 °C (12.5 TO 17.5)	+41.8 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

PASSBAND RIPPLE ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	214.55 MHz	215.25 Mhz	215.60 MHz
MIN INSERTION LOSS PERFORMANCE	-0.57 dB	-0.61 dB	-0.65 dB
{11b} 75% BW LOWER BANDEDGE FREQ	186.27 MHz	186.05 Mhz	185.88 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.98 dB	-1.05 dB	-1.11 dB
{11c} 75% BW UPPER BANDEDGE FREQ	244.77 MHz	244.55 Mhz	244.38 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.98 dB	-1.05 dB	-1.11 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.41 dB	0.44 dB	0.46 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.41 dB	0.44 dB	0.46 dB

H2 S21 log MAG 1 dB/ REF 0 dB 1: -.5724 dB

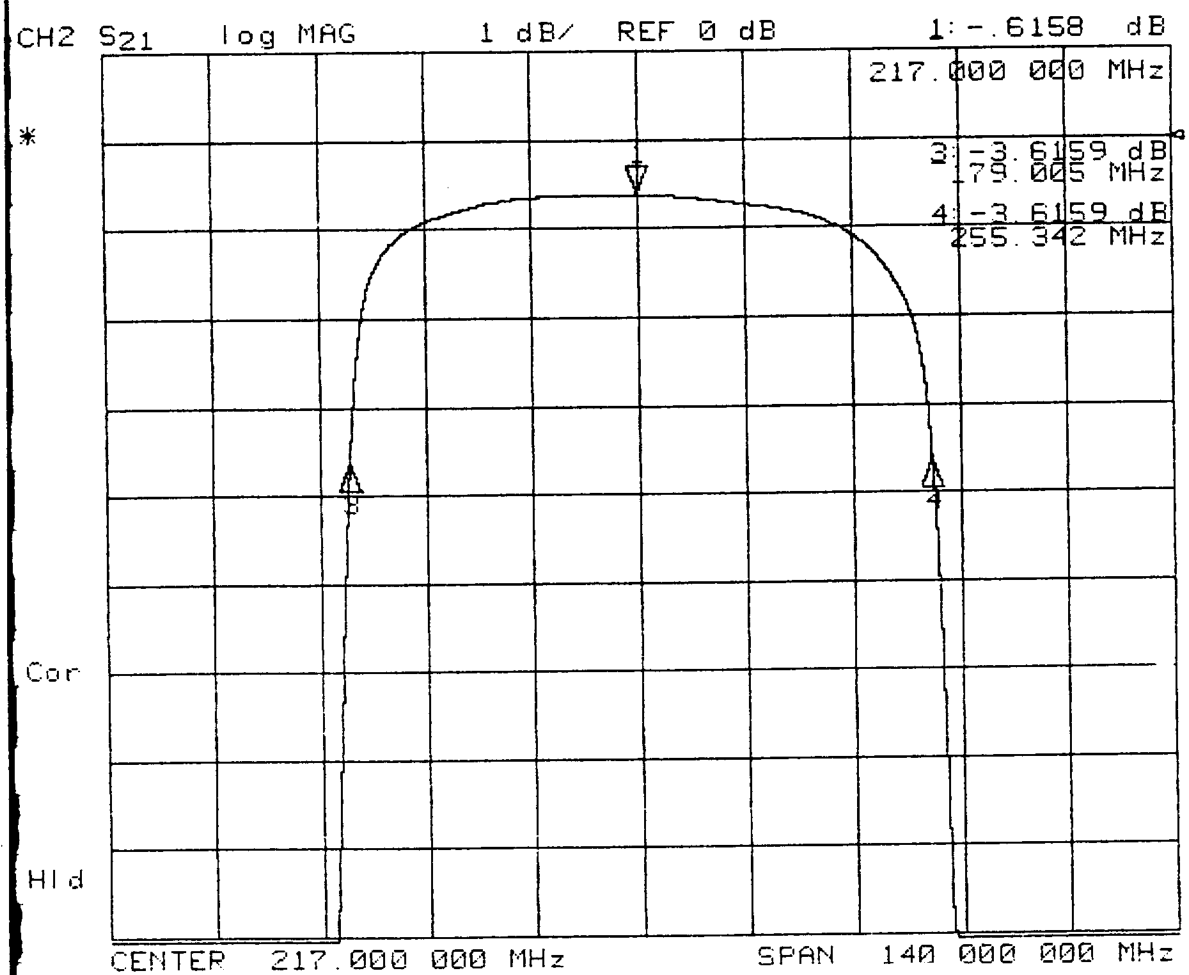


or

ld

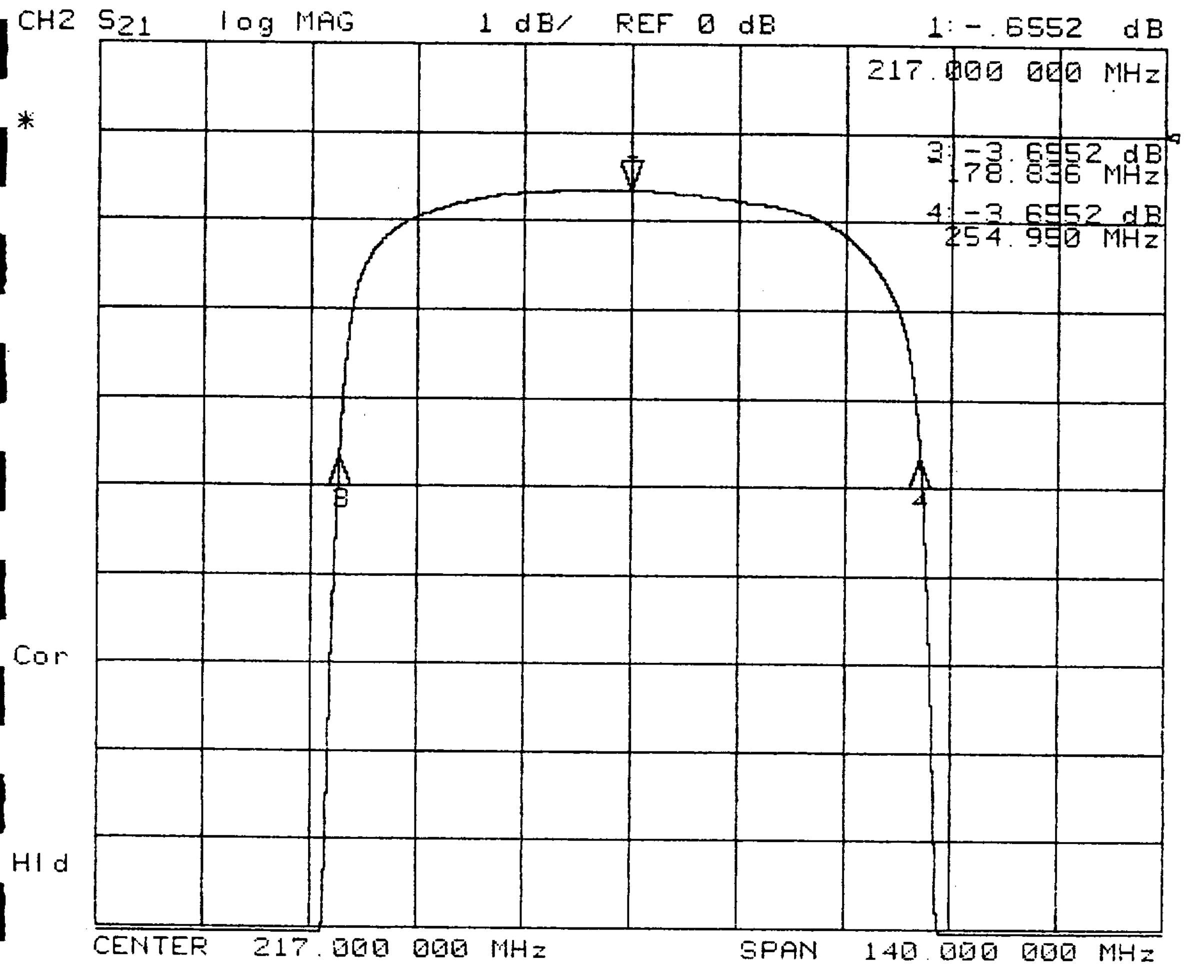
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P233-009
-10C DATA
OPR: R. HOGGATT DATE JAN 3 1 1997

ARKER PARAMET		annel 2
ARKER 1	181.900000 MHz OFF	217.000000 MHz -.5724 dB
ARKER 2	252.100000 MHz OFF	217.462525 MHz OFF
ARKER 3	187.750000 MHz OFF	179.185203 MHz -3.5724 dB
ARKER 4	246.250000 MHz OFF	255.739847 MHz -3.5724 dB
KR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
LACEMENT	CONTINUOUS	CONTINUOUS
ARKER SEARCH	OFF	OFF
ARGET VALUE	-14 dB	-3 dB
ARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
ARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P233-009
+15C DATA
OPR: R. HOGGATT DATE JAN 3 1 1997

MARKER PARAMET		annel 2
MARKER 1	181.900000 MHz OFF	217.000000 MHz -.6158 dB
MARKER 2	252.100000 MHz OFF	217.174116 MHz OFF
MARKER 3	187.750000 MHz OFF	179.005817 MHz -3.6159 dB
MARKER 4	246.250000 MHz OFF	255.342415 MHz -3.6159 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P233-009
+40C DATA
OPR: R. HOGGATT DATE JAN 3 1 1997

MARKER PARAMET		annel 2
MARKER 1	181.900000 MHz OFF	217.000000 MHz -.6552 dB
MARKER 2	252.100000 MHz OFF	216.893288 MHz OFF
MARKER 3	187.750000 MHz OFF	178.836288 MHz -3.6552 dB
MARKER 4	246.250000 MHz OFF	254.950289 MHz -3.6552 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX G

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL FX217-78-10SS1 S/N P233-009
AEROJET 1331559-7 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.7 dB MAX)	PASS/FAIL	PASS/FAIL	PASS/FAIL
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=217.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 166.3 MHz	-43.8 dB (40.0 dB MIN)	-43.9 dB (40.0 dB MIN)	-44.2 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 267.7 MHz TO 1000.0 MHz	-42.1 dB (40.0 dB MIN)	-42.3 dB (40.0 dB MIN)	-42.2 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-12.6 °C (-13.0 TO -10.0)	+15.9 °C (12.5 TO 17.5)	+42.0 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOTS	✓ (√)	✓ (√)	✓ (√)

TEST PERFORMED BY R. Hoggatt DATE 1/31/97 DA 5

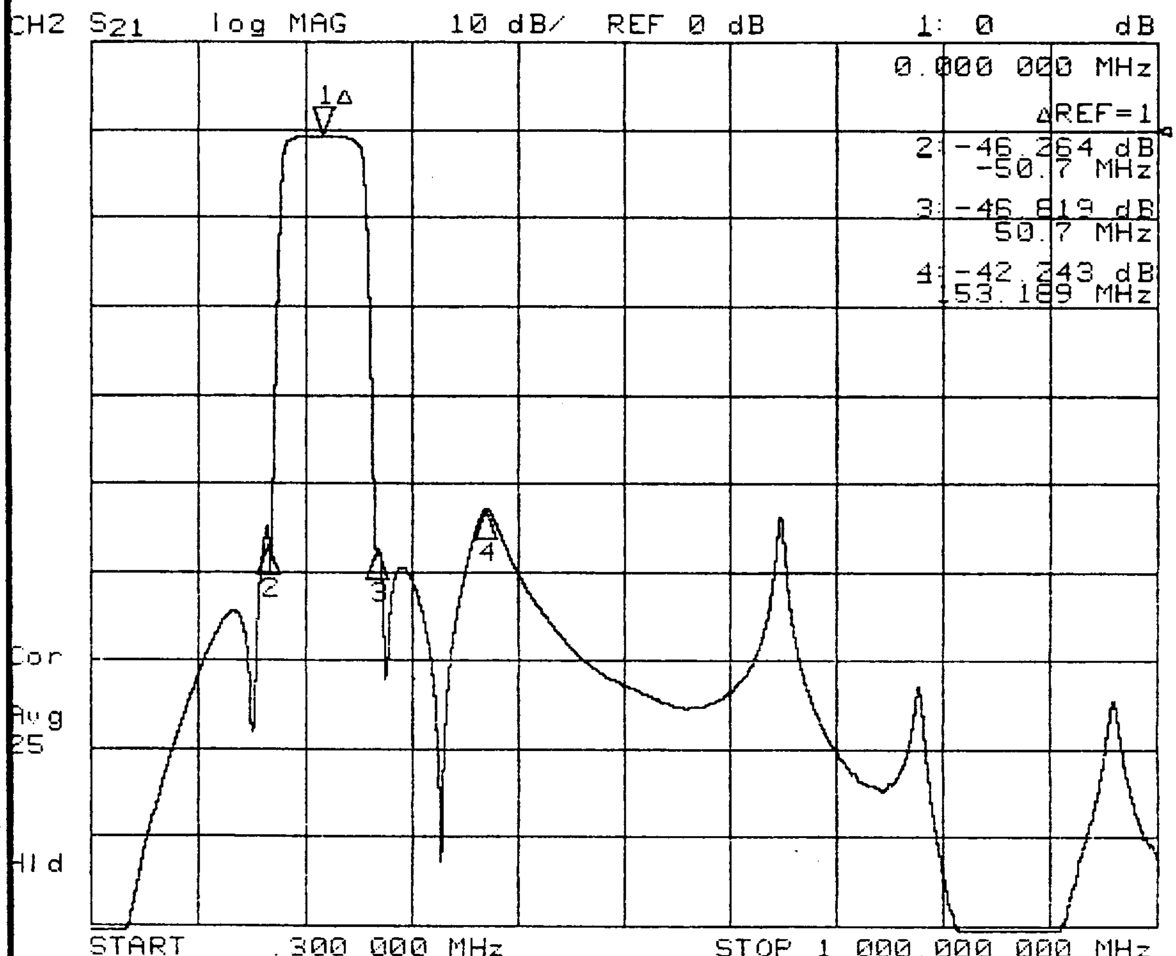
NOTE IF TEST WITNESSED BY AESD: ________ GSI: ______ Not Witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

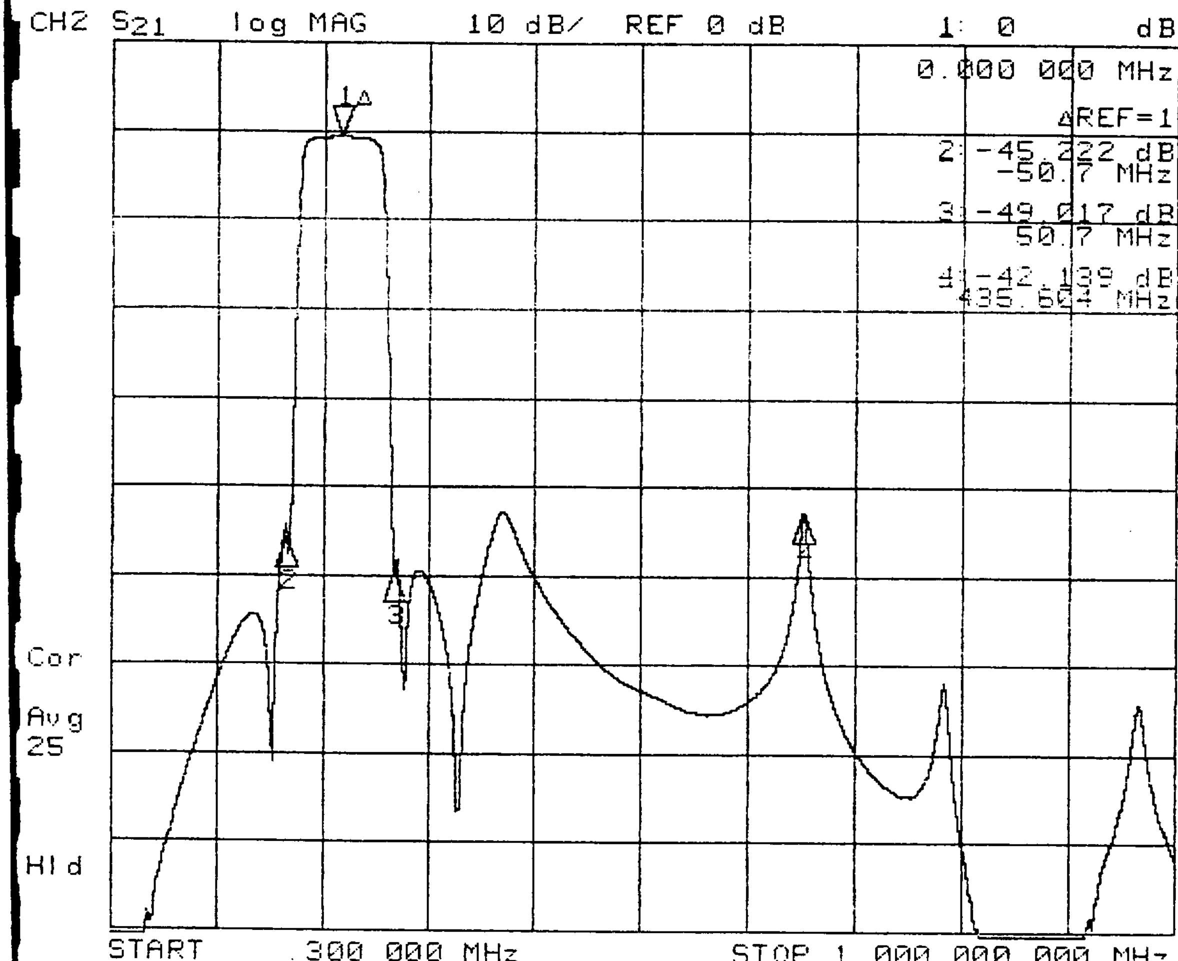
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	5.50 ± .03	5.505
MOUNTING HOLE CENTER	0.125 ± .010	.124
BETWEEN UPPER MOUNTING HOLES	$\boxed{5.250}$	5.250
BETWEEN LOWER MOUNTING HOLES	$\boxed{5.250}$	5.248



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P233-009
+40C DATA
OPR: R. HOGGATT DATE JAN 3 1 1997

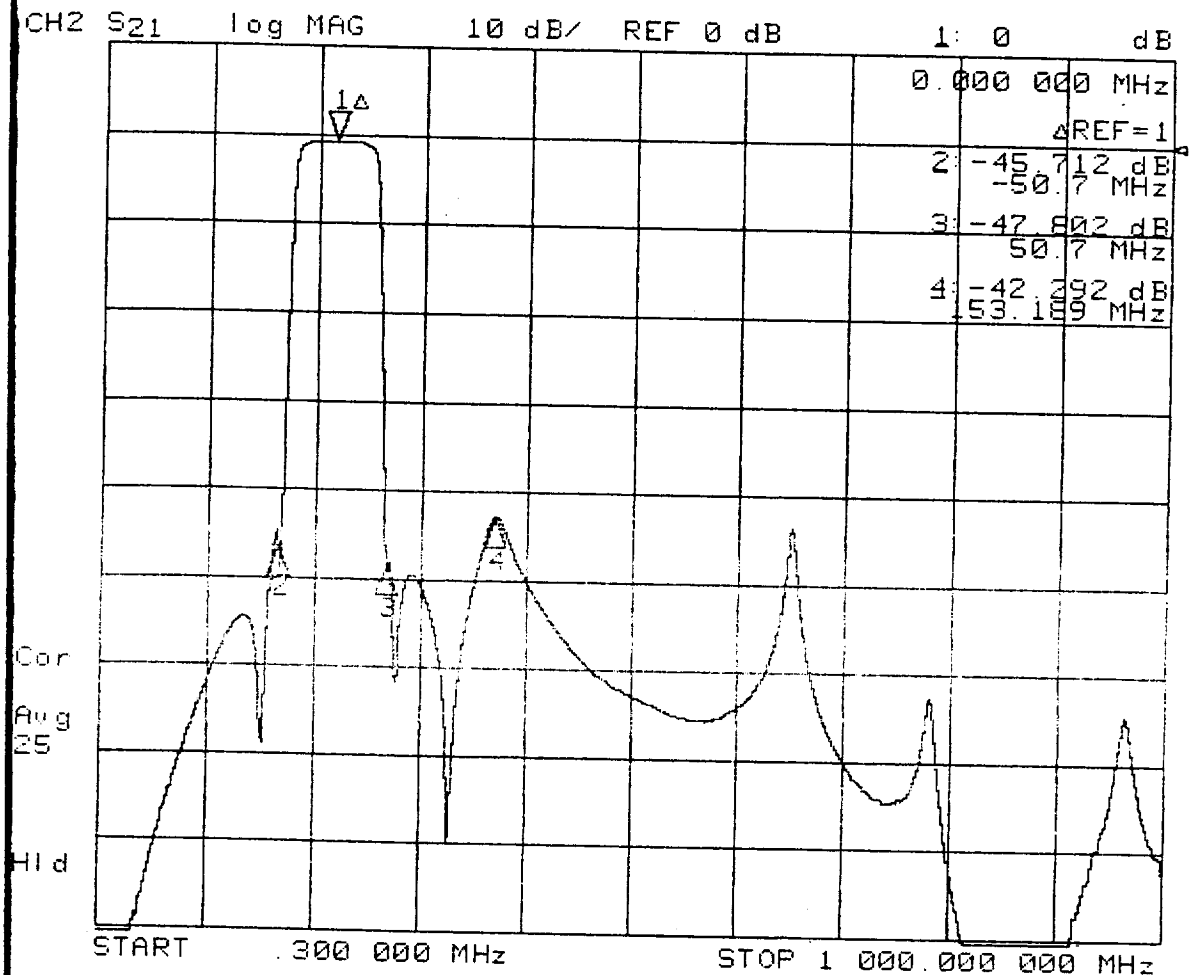
MARKER PARAMET		nnel 2
MARKER 1	1000.000000 MHz OFF	217.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	166.300000 MHz -46.264 dB
MARKER 3	1000.000000 MHz OFF	267.700000 MHz -46.819 dB
MARKER 4	1000.000000 MHz OFF	370.189049 MHz -42.243 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P233-009
-10C DATA
OPR: R. HOGGATT DATE JAN 3 1 1997

MARKER PARAMETI ... nnel 2

MARKER 1	1000.000000 MHz OFF	217.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	166.300000 MHz -45.222 dB
MARKER 3	1000.000000 MHz OFF	267.700000 MHz -49.017 dB
MARKER 4	1000.000000 MHz OFF	652.604313 MHz -42.139 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P233-009
+15C DATA
OPR: R. HOGGATT DATE JAN 3 1 1997

MARKER PARAMET		innel 2
MARKER 1	1000.000000 MHz OFF	217.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	166.300000 MHz -45.712 dB
MARKER 3	1000.000000 MHz OFF	267.700000 MHz -47.802 dB
MARKER 4	1000.000000 MHz OFF	370.189064 MHz -42.292 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

BANDPASS FILTER MODEL FX217-78-10SS1 S/N P233-009
AEROJET 1331559-7 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE +24.2 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	1.0	MHz	-105.5 dB	F11	217.0	MHz	-0.60 dB
F2	10.0	MHz	-106.8 dB	F12	(*) 224.0	MHz	-0.64 dB
F3	100.0	MHz	-61.8 dB	F13	(*) 230.0	MHz	-0.69 dB
F4	150.0	MHz	-67.4 dB	F14	240.0	MHz	-0.86 dB
F5	170.0	MHz	-42.0 dB	F15	250.0	MHz	-1.56 dB
F6	178.0	MHz	-6.32 dB	F16	256.0	MHz	-5.71 dB
F7	184.0	MHz	-1.30 dB	F17	264.0	MHz	-38.4 dB
F8	194.0	MHz	-0.79 dB	F18	300.0	MHz	-50.8 dB
F9	(*) 204.0	MHz	-0.65 dB	F19	500.0	MHz	-62.8 dB
F10	(*) 210.0	MHz	-0.61 dB	F20	1000.0	MHz	-82.3 dB

TEST PERFORMED BY: R. Hoggatt DATE 1/31/97 DA 6

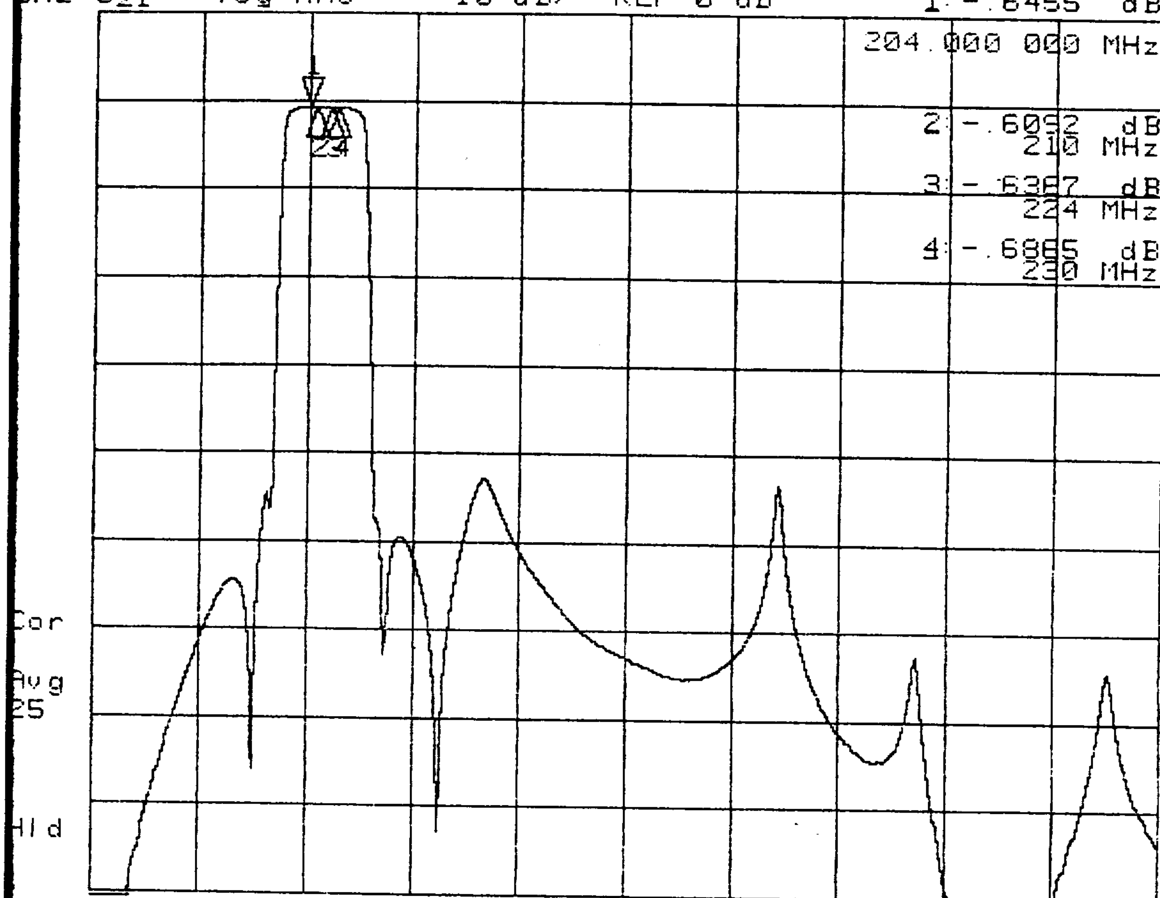
NOTE IF TEST WITNESSED BY AESD__________ GSI ______ Not Witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX G PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P233-009
AMBIENT
OPR: R. HOGGATT DATE JAN 3 1 1997

MARKER PARAMET		innel 2
MARKER 1	1000.000000 MHz OFF	204.000000 MHz -.6455 dB
MARKER 2	1000.000000 MHz OFF	210.000000 MHz -.6092 dB
MARKER 3	1000.000000 MHz OFF	224.000000 MHz -.6367 dB
MARKER 4	1000.000000 MHz OFF	230.000000 MHz -.6865 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Report No. 11491
June 1999

Channel 11 Bandpass Filter

SAW Filter (S/N: 1331576-1, S/N: B04)

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-1 PHONON PART: 100823 SERIAL: 204
TESTED BY: RA TITLE: Test tech DATE: 3/3/98 TIME: 5:00 pm
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A07982 CAL DUE: 2/10/98
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	-4.9 C		P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 273.335/275.065 MHz	274.672 MHz		P
		HI: 369.335/371.065 MHz	370.934 MHz		P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 34/36 MHz	34.911 MHz		P
		HI: 34/36 MHz	35.422 MHz		P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.3 dB		P
		HI: /0.5 dB	0.4 dB		P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		260.7-287.7 MHz: /1.0 dB	0.4 dB		P
		356.7-383.7 MHz: /1.0 dB	0.7 dB		P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.5 dB		P
		HI: 27.8/30.2 dB	28.5 dB		P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	-0.1 dB		P
		HI: -0.4/0.4 dB	0.1 dB		P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.1 dB		P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-225,420-1000 MHz:	43.0	0.000	
		DUAL: 225.000-249.935, 298.465-345.935, 394.465-420.00 MHz:	42.7	0.000	
		PEAK: 35.0/ dB	42.7 dB		P
		WIDTH: /7.2 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.29 Unitless		P
		HI: /1.30 Unitless	1.26 Unitless		P
3.2.1.14	5.2.12	VSWR (RETURN LOSS) 260.7-287.7,356.7-383.7 MHz			
		DUAL S11: 7.5/ dB	12.1 dB		P
		DUAL S22: 7.5/ dB	10.2 dB		P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.2/0.2 MHz	0 MHz		P
		3 dB BANDWIDTH: -0.72/0.72 MHz	0 MHz		P
		INSERTION LOSS: -0.5/0.5 dB	0 dB		P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P DP		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION

FILE=1AC8B04B.DAT 09:19:36 02-04-1998

PN_100828_823 FINAL_FUNCTIONAL TEMP:C FLIGHT4_FUNCT3 /N DUAL_SXX

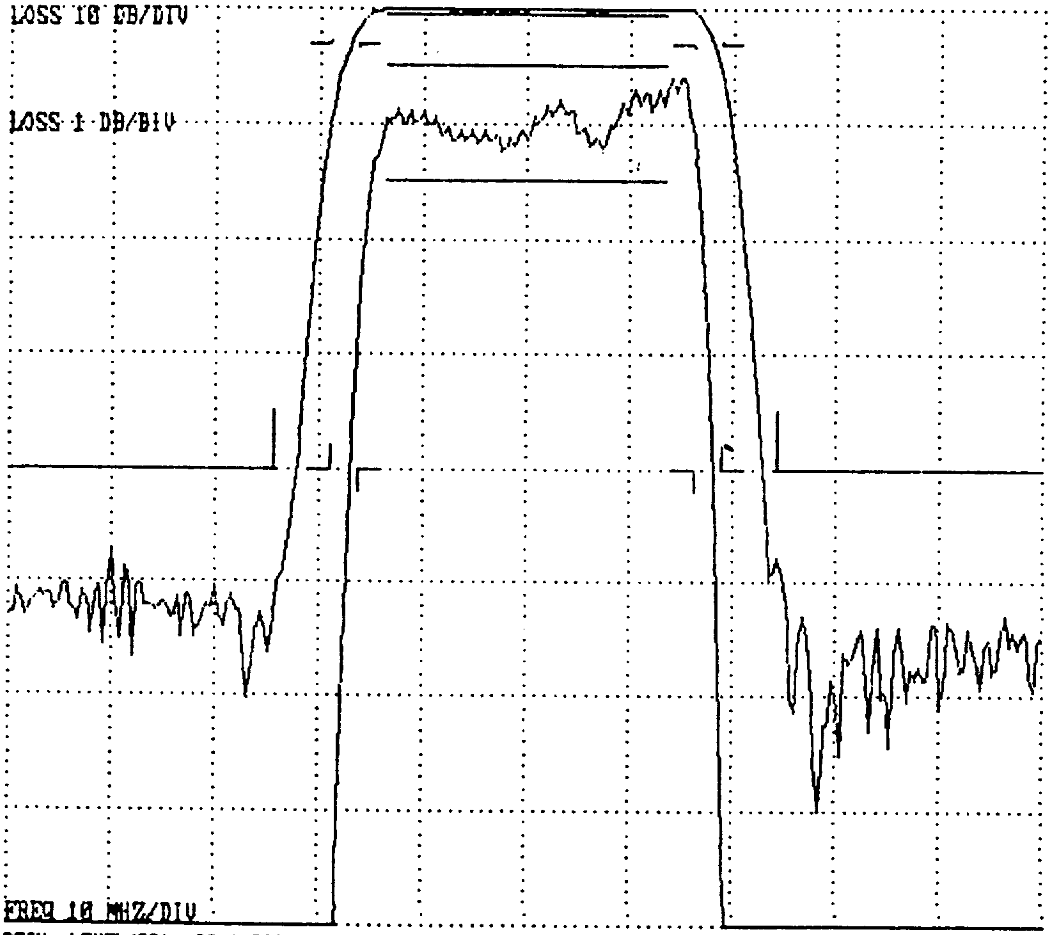
02-03-1998 HP8753,SSCF,SSFFIX,SSREF

FREQUENCY(MHZ): CENTER= 274.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27

REFERENCES: LOSS(DB)= 28.51665 PHASE(DEG)=-55510.86 DELAY(US)= 0 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= .1367906 PHASE(DEG)= 1172.853

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



PEAK: LEVEL(DB)= 28.11388 FREQ(MHZ)= 288.1927 DELAY(US)=-.4189385 SIDELOBE(DB)=-47.775

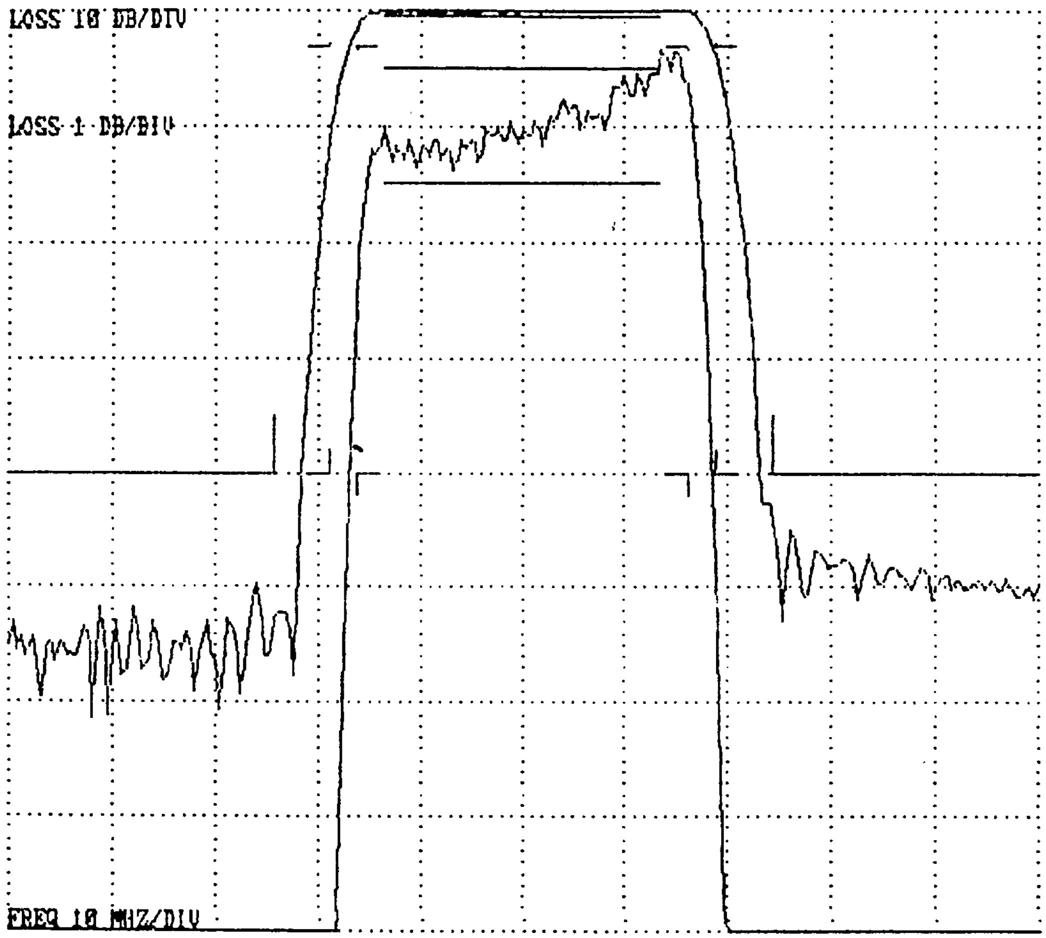
ENERGY: LEVEL(DB)= 28.67966 CENTER(MHZ)= 274.8599 WIDTH(MHZ)= 36.52169 SKEW(MHZ)=-.3051229

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.40	288.19269	288.19269	288.19269	0.00000	288.19269	0.00000	0.00	288.19269	288.19269
0.50	259.18808	290.73605	274.96207	31.54797	275.17184	31.69683	-12.96	259.18808	290.73605
1.00	258.55649	291.09097	274.82373	32.53448	274.99683	32.68880	-14.36	258.55649	291.09097
2.00	257.78033	291.72867	274.75452	33.94833	274.86093	33.52577	-16.05	257.78033	291.72867
3.00	257.21689	292.12759	274.67224	34.91071	274.87070	33.98675	-17.41	257.21689	292.12759
4.00	256.80521	292.47931	274.64227	35.67410	274.87396	34.35870	-18.99	256.80521	292.47931
5.00	256.45691	292.76016	274.60852	36.30325	274.87454	34.64421	-20.81	256.45691	292.76016
6.00	256.16583	293.01962	274.59271	36.85379	274.87247	34.85022	-22.90	256.16583	293.01962
10.00	255.29851	293.82416	274.56134	38.52565	274.86642	35.07542	-27.88	255.29851	293.82416
20.00	253.85397	295.17218	274.51306	41.31821	274.86108	35.16635	-37.73	253.85397	295.17218
30.00	252.93407	296.16537	274.54971	43.23131	274.85980	35.17529	-47.45	252.93407	296.16537
40.00	252.12337	297.08932	274.60635	44.96596	274.86002	35.17604	-53.00	252.12337	297.08932

BAND(MHZ)	260.700	287.700
LMIN(DB)	-0.30	
LMAX(DB)	0.24	
LDEL(DB)	0.53	
PMIN(DEG)	-1998.78	
PMAX(DEG)	1998.54	
PDEL(DEG)	3997.31	

File: 1AC8B04B.DAT Passband Symmetry = 0.3 dB

FILE=1CC8B04B.DAT 09:19:51 02-04-1998
PN_100828_823 FINAL_FUNCTIONAL TEMP:C FLIGHT4_FUNCT3 /N DUAL_SXX
02-03-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 370.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
REFERENCES: LOSS(DB)= 28.46074 PHASE(DEG)=-63172.09 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .2227819 PHASE(DEG)= 1128.857
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



PEAK: LEVEL(DB)= 27.76714 FREQ(MHZ)= 383.9135 DELAY(US)=-.4067777 SIDELOBE(DB)=-45.7598
ENERGY: LEVEL(DB)= 28.56613 CENTER(MHZ)= 371.4095 WIDTH(MHZ)= 36.85668 SKEW(MHZ)=-.7471973

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.69	383.91348	383.91348	383.91348	0.00000	383.91348	0.00000	0.00	383.91348	383.91348
0.50	354.89474	387.31635	371.10553	32.42160	371.49695	32.72547	-13.21	354.89474	387.31635
1.00	354.22583	387.71292	370.96936	33.48709	371.49084	33.41605	-14.18	354.22583	387.71292
2.00	353.68951	388.19568	370.94260	34.50616	371.34067	34.30483	-15.97	353.68951	388.19568
3.00	353.22305	388.64487	370.93396	35.42181	371.45090	34.98146	-18.16	353.22305	388.64487
4.00	352.86035	389.02725	370.94379	36.16690	371.43948	35.32071	-19.93	352.86035	389.02725
5.00	352.55511	389.32272	370.93890	36.76761	371.36969	35.45204	-20.87	352.55511	389.32272
6.00	352.29889	389.58713	370.94299	37.28824	371.43005	35.57113	-21.96	352.29889	389.58713
10.00	351.52225	390.35187	370.93707	38.82962	371.41669	35.85169	-27.05	351.52225	390.35187
20.00	350.24393	391.71628	370.98010	41.47235	371.40976	35.96122	-36.99	350.24393	391.71628
30.00	349.27267	392.64169	370.95718	43.36902	371.40936	35.97219	-48.34	349.27267	392.64169
40.00	348.57257	393.25552	370.91406	44.68295	371.40930	35.97252	-50.44	348.57257	393.25552

BAND(MHZ) 356.700 383.700
LMIN(DB) -0.47
LMAX(DB) 0.37
LDEL(DB) 0.84
PMIN(DEG) -1928.59
PMAX(DEG) 1920.71
PDEL(DEG) 3849.30
File: 1CC8B04B.DAT Passband Symmetry = 0.4 dB

ELECTRICAL TEST DATA SHEET

EROJET PART: 1331576-1 PHONON PART: 100823 SERIAL: B04
TESTED BY: RM TITLE: Test tech DATE: 2/3/96 TIME: 5:30 pm
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A07982 CAL DUE: 2/10/98
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	15.0	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 273.335/275.065 MHz	274.235	MHz	P
		HI: 369.335/371.065 MHz	370.348	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 34/36 MHz	34.857	MHz	P
		HI: 34/36 MHz	35.369	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.3	dB	P
		HI: /0.5 dB	0.4	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		260.7-287.7 MHz: /1.0 dB	0.4	dB	P
		356.7-383.7 MHz: /1.0 dB	0.7	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.6	dB	P
		HI: 27.8/30.2 dB	28.4	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.0	dB	P
		HI: -0.4/0.4 dB	0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.3	dB	P

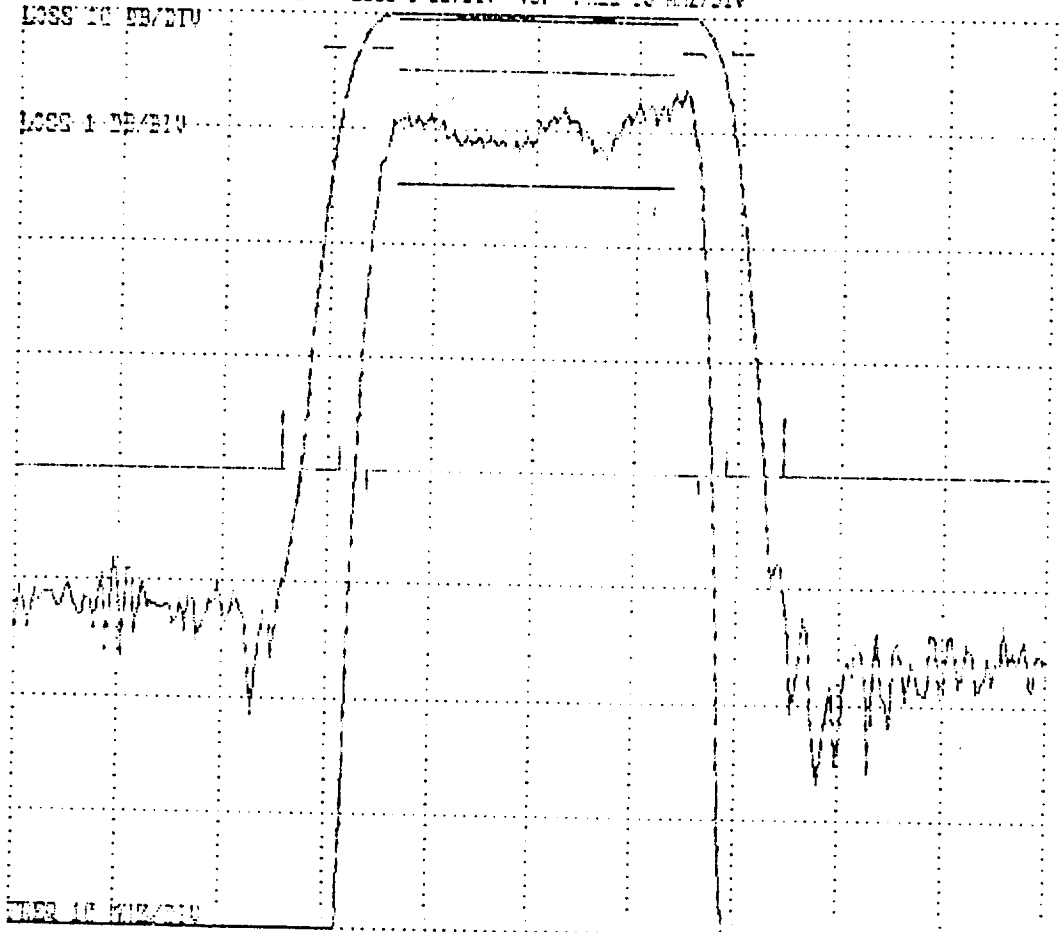
PARAGRAPH	Q/ATP	OUT-OF-BAND REJECTION BAND	PEAK(dB)	WIDTH(MHz)	P/F
3.2.1.11	5.2.10	WIDE: 1-225,420-1000 MHz:	43.2	0.000	
		DUAL: 225.000-249.935, 298.465-345.935, 394.465-420.00 MHz:	45.0	0.000	
		PEAK: 35.0/ dB	43.2 dB		P
		WIDTH: /7.2 MHz		0.000 MHz	P

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.29	Unitless	P
		HI: /1.30 Unitless	1.26	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS) 260.7-287.7,356.7-383.7 MHz			
		DUAL S11: 7.5/ dB	12.3	dB	P
		DUAL S22: 7.5/ dB	10.5	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.2/0.2 MHz	0.022	MHz	P
		3 dB BANDWIDTH: -0.72/0.72 MHz	+0.015	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	-0.1	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P	DP	

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION
FILE=1AR8B24B.DAT 09:33:45 02-04-1998
PN_102938_823 FINAL_FUNCTIONAL TEMP:R FLIGHT4_FUNCT3 /N DUAL_SXX
02-03-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 274.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
REFERENCES: LOSS(DB)= 28.53675 PHASE(DEG)=-45208.55 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1209559 PHASE(DEG)= 1174.69
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



PEAK: LEVEL(DB)= 28.27281 FREQ(MHZ)= 288.5936 DELAY(US)=-.4155692 SIDELOBE(DB)=-47.71727
ENERGY: LEVEL(DB)= 28.80742 CENTER(MHZ)= 274.3897 WIDTH(MHZ)= 36.4824 SKEW(MHZ)=-.2493069

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.36	288.59360	288.59360	288.59360	0.00000	288.59360	0.00000	0.00	288.59360	288.59360
0.50	258.75525	290.26520	274.51526	31.49985	274.72916	31.64064	-13.02	258.75525	290.26520
1.00	258.13861	290.61826	274.37842	32.47964	274.55242	32.62825	-14.43	258.13861	290.61826
2.00	257.36855	291.24731	274.30798	33.87866	274.41113	33.45082	-16.15	257.36855	291.24731
3.00	256.80606	291.66315	274.23462	34.85709	274.41561	33.91460	-17.51	256.80606	291.66315
4.00	256.39658	292.01828	274.20743	35.62170	274.41541	34.27983	-19.10	256.39658	292.01828
5.00	256.04819	292.30457	274.17639	36.25638	274.41367	34.55970	-20.94	256.04819	292.30457
6.00	255.75825	292.56015	274.15921	35.80190	274.35776	34.66381	-21.88	255.75825	292.56015
10.00	254.59292	293.36703	274.12997	38.47411	274.37784	34.94120	-26.61	254.59292	293.36703
20.00	253.44932	294.71799	274.02399	41.26801	274.39117	35.06694	-37.92	253.44932	294.71799
30.00	252.53148	295.71701	274.12424	43.18553	274.38965	35.07552	-47.73	252.53148	295.71701
40.00	251.70845	296.64450	274.17548	44.93605	274.38983	35.07621	-53.10	251.70845	296.64450

BAND(MHZ) 260.700 287.700
LMIN(DB) -0.27
LMAX(DB) 0.25
LDEL(DB) 0.52
PMIN(DEG) -2000.12
PMAX(DEG) 2003.42
PDEL(DEG) 4003.55
File: 1AR8B04B.DAT Passband Symmetry = 0.3 dB

PHONON CORPORATION

FILE=1DR8B04B.DAT 03:34:35 02-04-1998

PN_100828_803 FINAL_FUNCTIONAL TEMP:R FLIGHT4_FUNCT3 /N DUAL_SXX

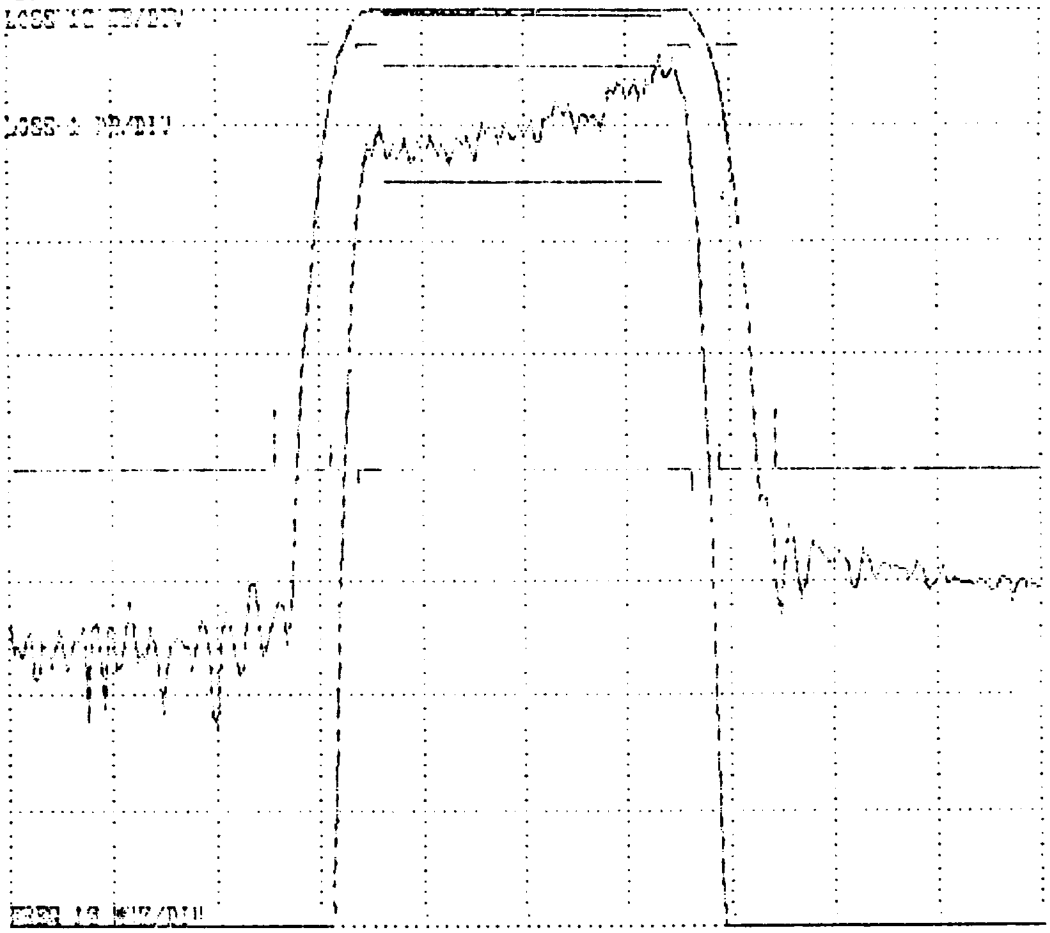
02-02-1998 HP8753,S8OF,S8FFIX,SSPEF

FREQUENCY(MHZ): CENTER= 370.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27

REFERENCES: LOSS(DB)= 28.27927 PHASE(DEG)=-55587.1 DELAY(US)= 0 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= .2166543 PHASE(DEG)= 1120.729

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



PEAK: LEVEL(DB)= 27.77775 FREQ(MHZ)= 383.3744 DELAY(US)=-.4052972 SIDELOBE(DB)=-43.02257

ENERGY: LEVEL(DB)= 23.51653 CENTER(MHZ)= 370.7654 WIDTH(MHZ)= 35.85106 SKEW(MHZ)=-.6503971

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.50	383.37436	383.37436	383.37436	0.00000	383.37436	0.00000	0.00	383.37436	383.37436
0.50	354.35938	386.60114	370.48026	32.24176	371.00870	33.51122	-13.23	354.35938	386.60114
1.00	353.70398	387.06097	370.38248	33.35699	370.82159	33.51261	-14.86	353.70398	387.06097
2.00	353.13742	387.57382	370.35562	34.43640	370.80937	34.07432	-16.27	353.13742	387.57382
3.00	352.66339	388.03217	370.34778	35.36877	370.79232	34.53583	-17.46	352.66339	388.03217
4.00	352.29437	388.41916	370.35675	36.12479	370.78849	34.91220	-19.10	352.29437	388.41916
5.00	352.01047	388.72757	370.36902	36.71710	370.78076	35.20074	-21.02	352.01047	388.72757
6.00	351.74582	388.98782	370.36682	37.24200	370.72234	35.30648	-22.01	351.74582	388.98782
10.00	350.96405	389.76270	370.36337	38.79865	370.74728	35.58310	-27.08	350.96405	389.76270
20.00	349.69284	391.12509	370.40897	41.43225	370.76511	35.69648	-39.09	349.69284	391.12509
30.00	348.71606	392.05704	370.38654	43.34097	370.76520	35.70259	-46.94	348.71606	392.05704
40.00	348.00574	392.68957	370.34772	44.68393	370.76514	35.70326	-50.57	348.00574	392.68957

BAND(MHZ) 356.700 383.700

LMIN(DB) -0.60

LMAX(DB) 0.35

LDEL(DB) 0.95

PMIN(DEG) -1931.55

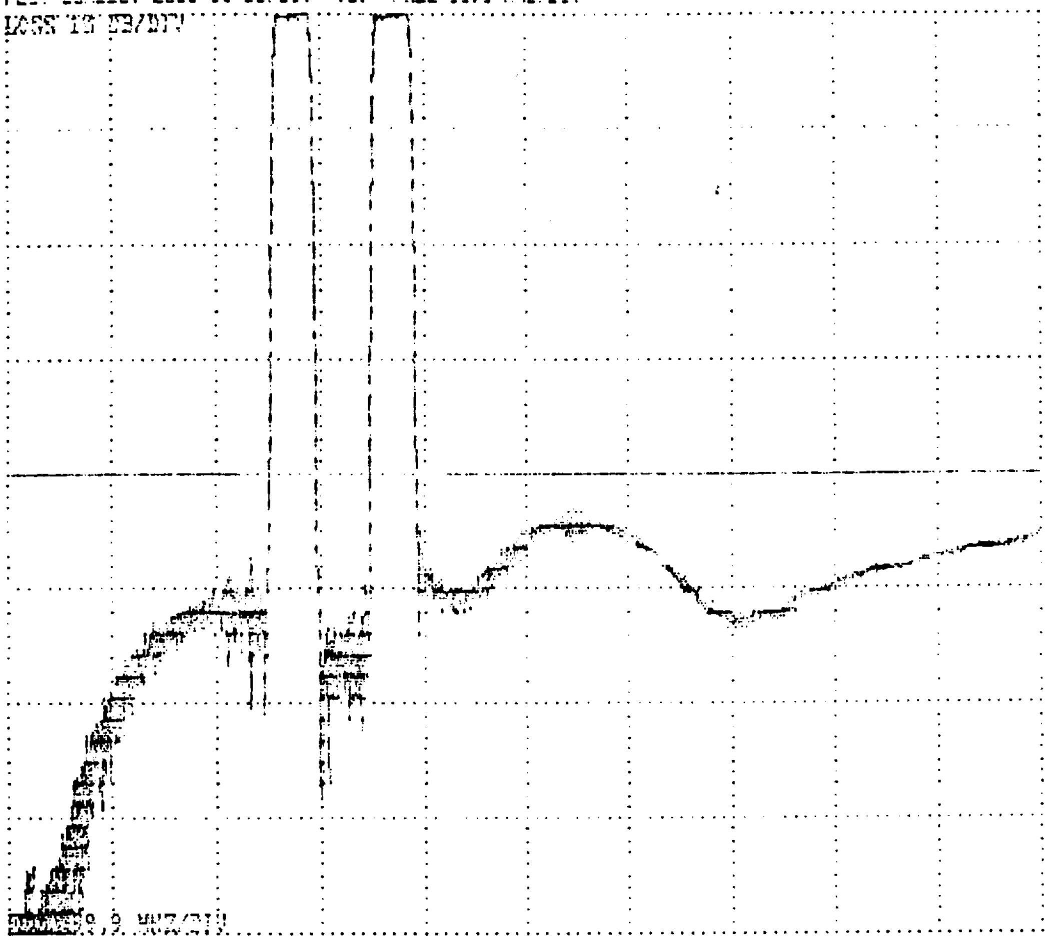
PMAX(DEG) 1926.29

PDEL(DEG) 3857.84

File: 1DR8B04B.DAT Passband Syssetry = 0.4 dB

PHONON CORPORATION

FILE=1ER8B04B.DAT 09:35:25 02-04-1999
PN_100823_823 FINAL_FUNCTIONAL TEMP:R FLIGHT4_FUNCT2 /N WIDE_S21
02-03-1999 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 500.5 WIDTH= 999 INCR.= .203125 SYSTEM BANDWIDTH= 999
REFERENCES: LOSS(DB)= 20.53901 PHASE(DEG)=-14226.4 DELAY(US)= 5.432157E-02 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 15.79341 PHASE(DEG)= 4454.975
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV



PEAK: LEVEL(DB)= 27.97175 FREQ(MHZ)= 383.2516 DELAY(US)=-.3010743 SIDELOBE(DB)=-43.02809
ENERGY: LEVEL(DB)= 28.76319 CENTER(MHZ)= 323.3555 WIDTH(MHZ)= 73.24539 SKEW(MHZ)= 3.689157

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.54	383.35156	383.35156	383.35156	0.00000	383.35156	0.00000	0.00	383.35156	383.35156
0.50	354.46457	386.51331	370.48907	32.04842	370.94569	31.66505	-14.12	258.92134	386.51331
1.00	353.73160	387.02509	370.37885	33.29449	370.75641	32.71973	-14.23	258.29974	387.02509
2.00	353.17014	387.53702	370.35258	34.36599	370.82135	33.46701	-14.32	257.44571	387.53702
3.00	352.59569	387.99277	370.34473	35.29608	370.75043	34.25062	-14.39	256.86451	387.99277
4.00	352.31476	388.38910	370.35193	36.07434	370.74960	34.41317	-14.43	256.43350	388.38910
5.00	352.02243	388.70071	370.36157	36.67828	370.75031	34.55921	-14.44	256.02890	388.70071
6.00	351.76256	388.96759	370.36511	37.20493	370.77314	34.73580	-14.46	255.73147	388.96759
10.00	350.97297	389.75119	370.36258	38.77722	370.75574	34.99379	-14.49	254.91478	389.75119
20.00	349.69772	391.11386	370.40579	41.41614	370.76105	35.10233	-14.49	253.46500	391.11386
30.00	348.72351	392.05536	370.38943	43.33185	370.76074	35.10322	-14.48	252.53792	392.05536
40.00	348.01022	392.54745	370.32885	44.53724	370.76077	35.10592	-14.48	251.73914	392.54746

BAND(MHZ)	1.000 325.000	325.000 422.000	422.000 1000.000
LMIN(DB)	49.04	-0.54	43.15
LMAX(DB)	115.94	68.35	53.52
LDEL(DB)	66.91	68.89	10.37
PMIN(DEG)	3734.97	-3911.95	-3387.25
PMAX(DEG)	7504.01	7968.56	7867.52
PDEL(DEG)	3769.04	11880.53	11254.97

FILE: 1ER8B04B.DAT Out-of-band Rejection: PEAK= 43.2 dB WIDTH= 0.000 MHz

PHONON CORPORATION

FILE=1FRSB04B.DAT 09:35:51 02-04-1998

PN_100828_823 FINAL_FUNCTIONAL TEMP:R FLIGHT4_FUNCT2 /N DUAL_SXX

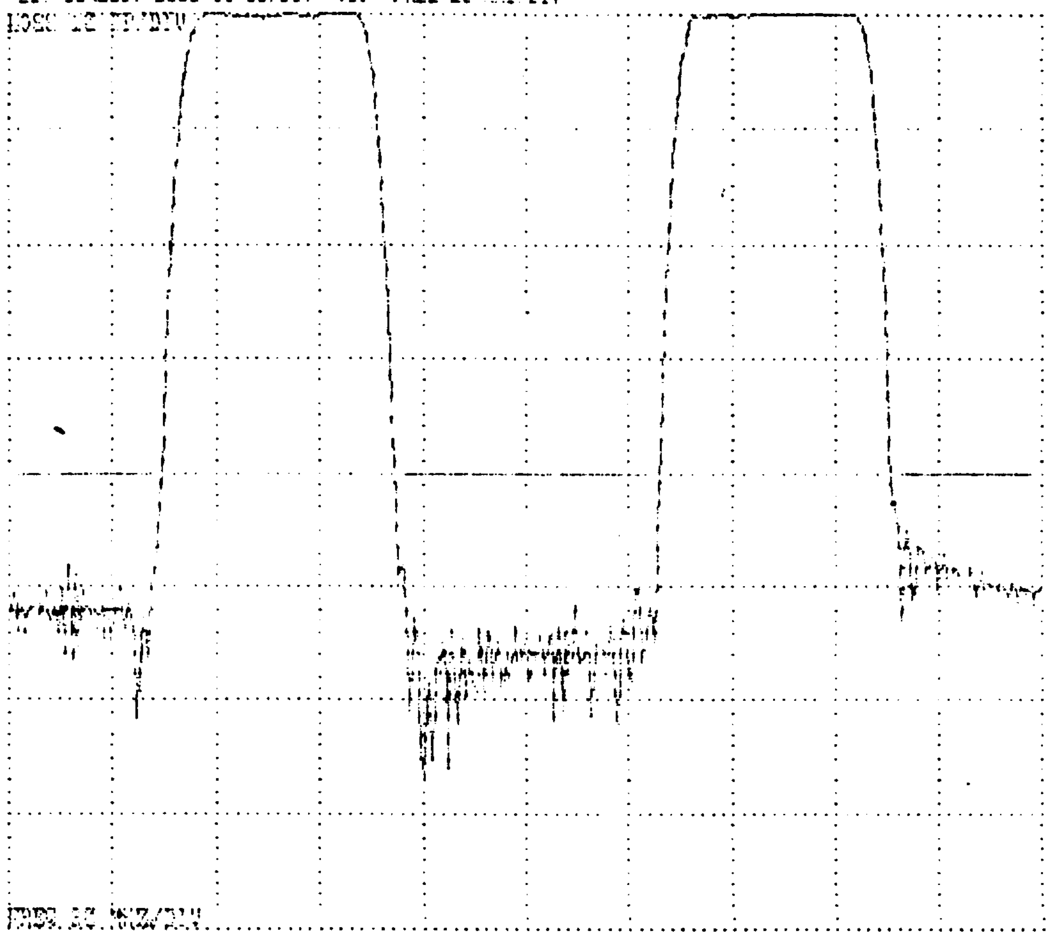
02-03-1998 HP8753,SSREF,SSREF

FREQUENCY(MHZ): CENTER= 322.2 WIDTH= 200 INCR.= .4 SYSTEM BANDWIDTH= 200

REFERENCES: LOSS(DB)= 26.53521 PHASE(DEG)=-52034.23 DELAY(US)= .2228372 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= 25.42777 PHASE(DEG)= 924.9724

PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 20 MHZ/DIV



PEAK: LEVEL(DB)= 27.77775 FREQ(MHZ)= 383.3744 DELAY(US)= 6.237819E-02 SIDELOBE(DB)=-42.03257

ENERGY: LEVEL(DB)= 28.55401 CENTER(MHZ)= 324.4321 WIDTH(MHZ)= 73.25163 SKEW(MHZ)=-2.426946

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.73	383.37435	383.37435	383.37435	0.00000	383.37435	0.00000	0.00	383.37435	383.37435
0.50	354.18192	386.74771	370.46481	32.56580	370.83121	33.84682	-6.57	258.93622	386.74771
1.00	353.61751	387.13133	370.37451	33.51376	370.82159	34.52088	-6.62	258.28821	387.13133
2.00	353.07562	387.63272	370.35419	34.55710	370.80327	35.09949	-6.67	257.45047	387.63272
3.00	352.60989	388.08893	370.34943	35.47903	370.79822	35.57489	-6.70	256.87109	388.08893
4.00	352.25295	388.46259	370.35779	36.20963	370.78842	35.96259	-6.72	256.44412	388.46259
5.00	351.97565	388.76340	370.35951	36.78775	370.78979	35.25981	-6.75	256.09902	388.76340
6.00	351.71475	389.01855	370.36664	37.30380	370.77521	35.47102	-6.76	255.73297	389.01855
10.00	350.94454	389.78503	370.36484	38.84023	370.74731	35.55365	-6.75	254.91672	389.78503
20.00	349.67923	391.14066	370.40994	41.46143	370.76514	35.77044	-6.69	253.45451	391.14066
30.00	348.70520	392.06601	370.38562	43.36081	370.76523	35.77674	-6.64	252.54117	392.06601
40.00	347.98814	392.70343	370.35077	44.70529	370.76517	35.77743	-6.60	251.72620	392.70343

BAND(MHZ)	250.700	357.700	356.700	383.700
LMIN(DB)	-0.14	-0.23	-0.73	
LMAX(DB)	0.38	56.81	0.22	
LDEL(DB)	0.52	57.04	0.95	
PMIN(DEG)	-891.38	-1725.98	-454.48	
PMAX(DEG)	899.29	1813.77	1190.47	
PDEL(DEG)	1790.66	3539.75	1644.95	

FILE: 1FRSB04B.DAT Out-of-band Rejection: PEAK= 45.0 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE: 1FR88048.DAT (+SSCF)
PN_180528_923 FINAL_FUNCTIONAL TEMP:R FLIGHT4_FUNCT3 /N DUAL_SXX
02-03-1998 HP8753,SSREF,SSREF,SSCF
REFERENCES: LOSS(DB)= 28.50821 PHASE(DEG)= -52034.13
DELAY(US)= .2328372 SLOPE(US/MHZ)= 0

BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY(MHZ)	LOSS(DB)	PHASE(DEG)
240.600	54.53	722.43
248.760	54.78	1295.06
256.920	2.51	1159.02
265.080	0.38	653.85
273.240	0.19	55.50
281.400	0.25	-488.15
289.560	0.17	-1034.12
297.720	43.71	-1595.30
305.880	54.63	-1432.78
314.040	59.78	-819.35
322.200	54.53	-192.55
330.360	55.32	485.95
338.520	53.50	1187.96
346.680	52.55	1212.43
354.840	0.23	1015.47
363.000	0.23	319.25
371.160	-0.11	337.55
379.320	-0.42	-133.25
387.480	1.06	-605.25
395.640	45.26	-520.31
403.800	49.12	-134.73

ELECTRICAL TEST DATA SHEET

EROJET PART: 1331576-1 PHONON PART: 100823 SERIAL: B04

TESTED BY: MM TITLE: Test tech DATE: 3/3/98 TIME: 5:30pm

TEST: FINAL FUNCTIONAL

EQUIPMENT: HP 8753D SERIAL: 3410A07982 CAL DUE: 2/10/98

HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	35.3	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 273.335/275.065 MHz	273.814	MHz	P
		HI: 369.335/371.065 MHz	369.759	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 34/36 MHz	34.802	MHz	P
		HI: 34/36 MHz	35.300	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.2	dB	P
		HI: /0.5 dB	0.3	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		260.7-287.7 MHz: /1.0 dB	0.5	dB	P
		356.7-383.7 MHz: /1.0 dB	0.7	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.8	dB	P
		HI: 27.8/30.2 dB	28.3	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.1	dB	P
		HI: -0.4/0.4 dB	-0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.4	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			

BAND	PEAK(dB)		WIDTH(MHz)		P/F
WIDE: 1-225,420-1000 MHz:	43.7		0.000		
DUAL: 225.000-249.935, 298.465-345.935, 394.465-420.00 MHz:	44.9		0.000		
PEAK: 35.0/ dB	43.7	dB			P
WIDTH: /7.2 MHz			0.000	MHz	P

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.29	Unitless	P
		HI: /1.30 Unitless	1.27	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		260.7-287.7,356.7-383.7 MHz			
		DUAL S11: 7.5/ dB	12.5	dB	P
		DUAL S22: 7.5/ dB	10.4	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.2/0.2 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.72/0.72 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P		DP

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION

FILE=1AH22242.DAT 09:45:08 02-04-1999

PN_100023_222 FINAL_FUNCTIONAL TEMP:H FLIGHT4_FUNCT2 /N DUAL_SXX

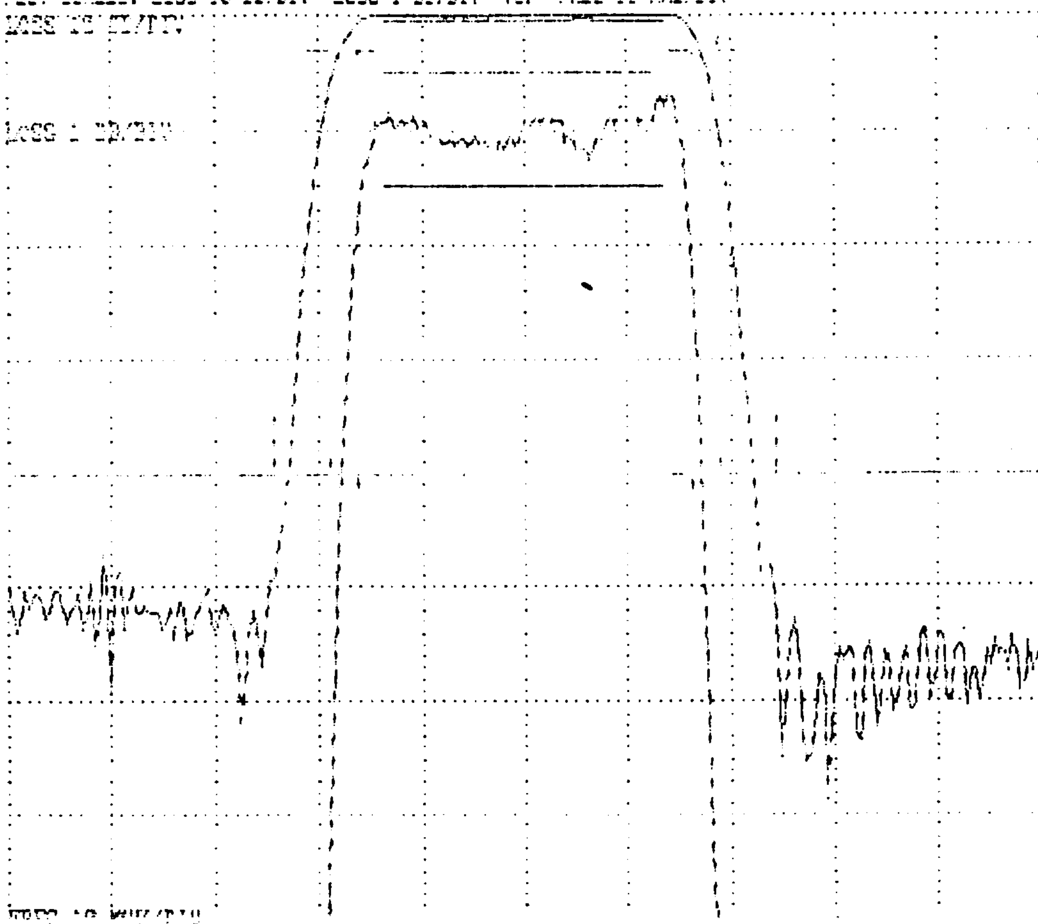
02-03-1999 HSETED,280F,08FFIX,00REF

FREQUENCY(MHZ): CENTER= 274.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27

REFERENCES: LOSS(DB)= 28.77777 PHASE(DEG)=-43501.48 DELAY(US)= 0 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= .1274173 PHASE(DEG)= 1176.46

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



PEAK: LEVEL(DB)= 28.43666 FREQ(MHZ)= 288.252 DELAY(US)=-.4176305 SIDELOBE(DB)=-47.48802

ENERGY: LEVEL(DB)= 28.95569 CENTER(MHZ)= 273.9335 WIDTH(MHZ)= 36.44015 SKEW(MHZ)=-.1920157

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.34	288.25204	288.25204	288.25204	0.00000	288.25204	0.00000	0.00	288.25204	288.25204
0.50	258.35757	289.80438	274.08102	31.44672	274.08042	31.58583	-13.08	258.35757	289.80438
1.00	257.73535	290.15729	273.94632	32.42194	273.95079	32.25579	-13.98	257.73535	290.15729
2.00	256.97269	290.79523	273.88397	33.82254	273.95642	33.33513	-16.24	256.97269	290.79523
3.00	256.41257	291.21472	273.81365	34.80215	273.96382	33.84155	-17.52	256.41257	291.21472
4.00	256.00082	291.57015	273.78549	35.56934	273.95725	34.20058	-19.22	256.00082	291.57015
5.00	255.65331	291.86124	273.75723	36.20802	273.95249	34.47509	-21.35	255.65331	291.86124
6.00	255.36363	292.11234	273.73798	36.74870	273.93683	34.57874	-22.03	255.36363	292.11234
10.00	254.49960	292.92430	273.71225	38.42523	273.92395	34.84794	-25.80	254.49960	292.92430
20.00	253.05821	294.27863	273.66843	41.22041	273.93515	34.95643	-38.12	253.05821	294.27863
30.00	252.13559	295.28250	273.70905	43.14691	273.93252	34.97651	-47.93	252.13559	295.28250
40.00	251.30095	296.21359	273.75725	44.91264	273.93359	34.97725	-52.20	251.30095	296.21359

BAND(MHZ) 260.700 287.700

LMIN(DB) -0.29

LMAX(DB) 0.27

LDEL(DB) 0.56

PMIN(DEG) -2003.21

PMAX(DEG) 2007.00

PDEL(DEG) 4010.21

File: 1AH22042.DAT Passband Symmetry = 0.2 dB

PHONON CORPORATION

FILE=1CH82242.DAT 09:49:58 02-04-1993

PN_100328_E02 FINAL_FUNCTIONAL TEMP:H FLIGHT4_FUNCT2 +N DUAL_EXX

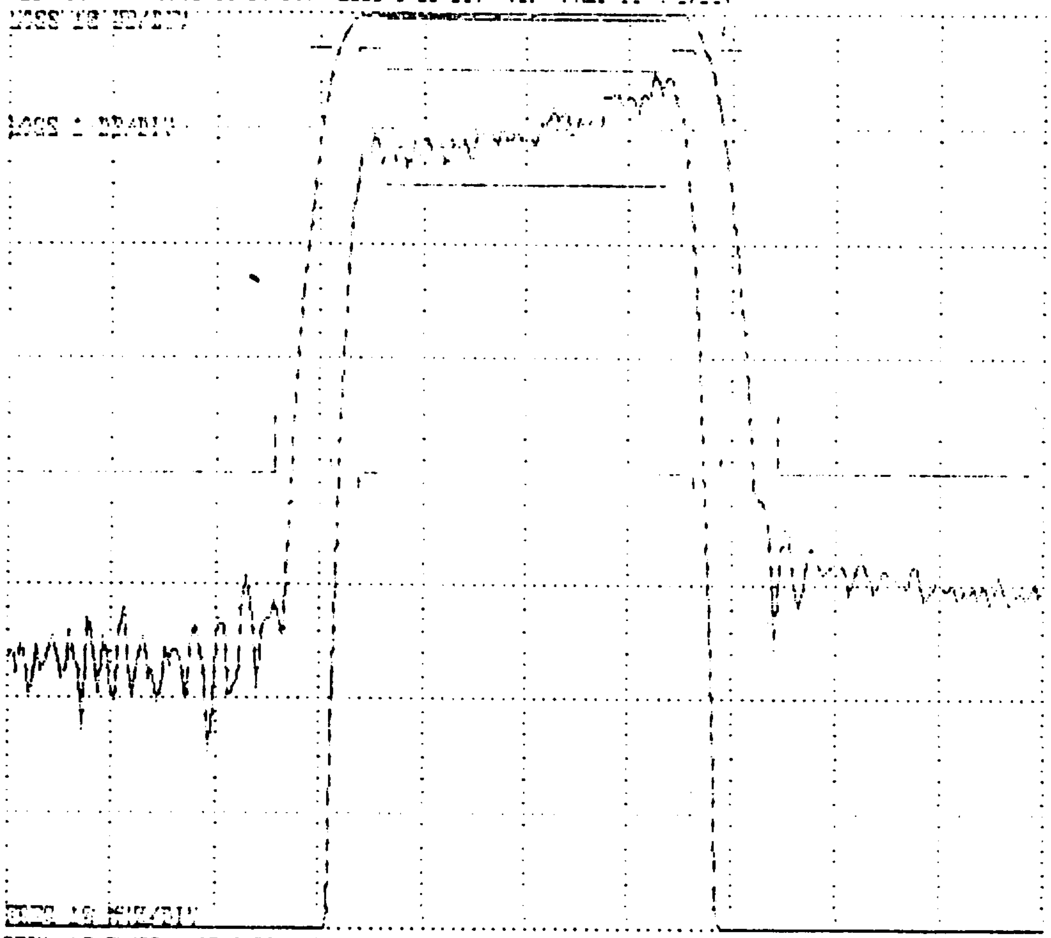
02-02-1993 HP8752,SSOF,SSFFIX,SSREF

FREQUENCY(MHZ): CENTER= 370.0 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27

REFERENCES: LOSS(DB)= 28.2281 PHASE(DEG)=-57299.33 DELAY(US)= 0 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= .1981521 PHASE(DEG)= 1102.513

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



PEAK: LEVEL(DB)= 27.84558 FREQ(MHZ)= 382.7443 DELAY(US)=-.4071226 SIDELOBE(DB)=-45.57803

ENERGY: LEVEL(DB)= 28.49757 CENTER(MHZ)= 370.122 WIDTH(MHZ)= 36.93595 SKEW(MHZ)=-.5587582

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-2.49	382.74432	382.74432	382.74432	0.00000	382.74432	0.00000	0.00	382.74432	382.74432
0.50	353.81927	385.92235	369.87082	32.10323	370.35547	31.99553	-12.91	353.81927	385.92235
1.00	353.12350	386.42075	369.77213	33.29724	370.15583	32.02717	-14.35	353.12350	386.42075
2.00	352.58127	386.94358	369.76544	34.36832	370.22232	33.28523	-16.14	352.58127	386.94358
3.00	352.10870	387.40875	369.75873	35.30005	370.13757	34.54434	-18.27	352.10870	387.40875
4.00	351.74237	387.80878	369.77557	36.06641	370.13115	34.87135	-20.15	351.74237	387.80878
5.00	351.44913	388.11215	369.78064	36.66302	370.13116	34.87125	-20.12	351.44913	388.11215
6.00	351.18802	388.38443	369.78622	37.19641	370.12711	35.11130	-22.21	351.18802	388.38443
10.00	350.41438	389.16251	369.78876	38.74753	370.12265	35.37835	-27.37	350.41438	389.16251
20.00	349.12937	390.52323	369.82615	41.39417	370.12127	35.48048	-37.32	349.12937	390.52323
30.00	348.16269	391.46799	369.81534	43.30530	370.12190	35.49052	-48.71	348.16269	391.46799
40.00	347.44330	392.12165	369.77246	44.65835	370.12177	35.49088	-52.42	347.44330	392.12165

BAND(MHZ) 356.700 383.700

LMIN(DB) -0.45

LMAX(DB) 0.35

LDEL(DB) 0.83

PMIN(DEG) -1932.14

PMAX(DEG) 1928.94

PDEL(DEG) 3861.08

File: 1CH82242.DAT Passband Symmetry = 0.2 dB

Report No. 11491
June 1999

Channel 12 Bandpass Filter

SAW Filter (S/N: 1331576-2, S/N: B06)

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-2 PHONON PART: 100824 SERIAL:B06
TESTED BY: 210 TITLE: Test Tech DATE: 5/12/98 TIME: 11:00AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL:3410A04374 CAL DUE:1/29/99
HP 3478A SERIAL:2136A03127 CAL DUE:7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE		DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE		-5.4	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &				
3.2.1.4		CENTER FREQUENCY STABILITY				
		LO: 299.335/301.065 MHz		300.404	MHz	P
		HI: 343.335/345.065 MHz		344.221	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:				
		LO: 15/16 MHz		15.434	MHz	P
		HI: 15/16 MHz		15.510	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY				
		LO: /0.5 dB		0.1	dB	P
		HI: /0.5 dB		0.3	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE				
		294.2-306.2 MHz: /1.0 dB		0.4	dB	P
		338.2-350.2 MHz: /1.0 dB		0.6	dB	P
3.2.1.8	5.2.7	INSERTION LOSS				
		LO: 27.8/30.2 dB		28.3	dB	P
		HI: 27.8/30.2 dB		28.8	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION				
		LO: -0.4/0.4 dB		-0.2	dB	P
		HI: -0.4/0.4 dB		0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE				
		LO,HI: /0.5 dB		0.5	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION				
		BAND	PEAK(dB)	WIDTH(MHz)		
		WIDE: 1-286,359-1000 MHz:	44.1	0.000		
		DUAL: 286.000-288.935, 311.465-332.935, 355.465-359.00 MHz:	46.9	0.000		
		PEAK: 35.0/ dB	44.1 dB			P
		WIDTH: /3.2 MHz		0.000	MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR				
		LO: /1.30 Unitless		1.28	Unitless	P
		HI: /1.30 Unitless		1.30	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)				
		294.2-306.2,338.2-350.2 MHz				
		DUAL S11: 7.5/ dB		17.5	dB	P
		DUAL S22: 7.5/ dB		9.0	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS				
		CENTER FREQUENCY: -0.2/0.2 MHz		0	MHz	P
		3 dB BANDWIDTH: -0.32/0.32 MHz		0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB		0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)		P QP		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION

FILE=2AC8B06A.DAT 14:29:17 05-12-1998

PN_100830_824 FINAL_FUNCTIONAL TEMP:C FLIGHT6_3FUNCT /N DUAL_SXX

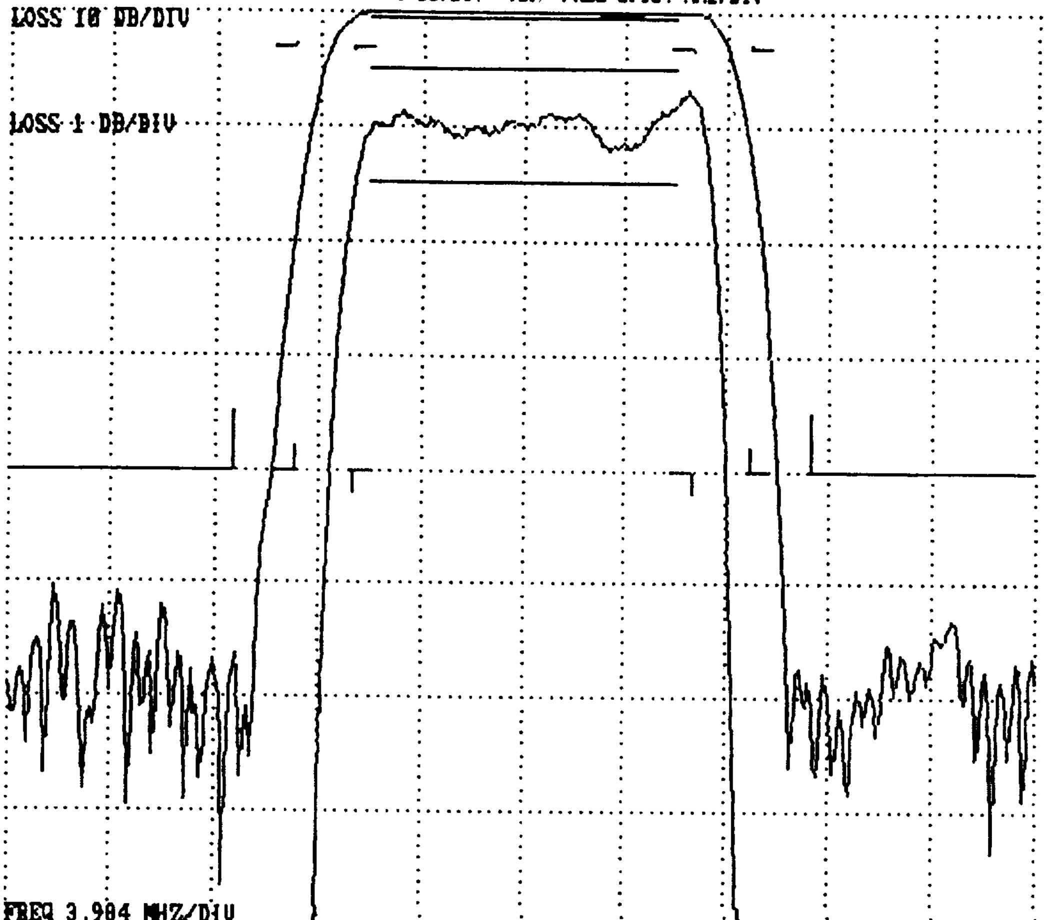
05-12-1998 HP8753,SSCF,SSFFIX,SSREF

FREQUENCY(MHZ): CENTER= 300.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12

REFERENCES: LOSS(DB)= 28.34716 PHASE(DEG)=-30008.7 DELAY(US)= 0 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= 9.174058E-02 PHASE(DEG)= 1736.986

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV



PEAK: LEVEL(DB)= 28.01208 FREQ(MHZ)= 306.6893 DELAY(US)=-1.385806 SIDELOBE(DB)=-50.76113

ENERGY: LEVEL(DB)= 28.52174 CENTER(MHZ)= 300.4377 WIDTH(MHZ)= 16.13811 SKEW(MHZ)=-2.644642E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.34	306.68927	306.68927	306.68927	0.00000	306.68927	0.00000	0.00	306.68927	306.68927
0.50	293.57147	307.47729	300.52438	13.90582	300.52411	13.93194	-12.20	293.57147	307.47729
1.00	293.26083	307.65585	300.45834	14.39502	300.52277	14.33450	-13.40	293.26083	307.65585
2.00	292.90564	307.92114	300.41339	15.01550	300.47345	14.76601	-15.30	292.90564	307.92114
3.00	292.68719	308.12097	300.40408	15.43378	300.46799	15.03521	-17.20	292.68719	308.12097
4.00	292.51169	308.27469	300.39319	15.76300	300.43924	15.19091	-18.91	292.51169	308.27469
5.00	292.37042	308.40570	300.38806	16.03528	300.43961	15.27214	-20.17	292.37042	308.40570
6.00	292.25110	308.51767	300.38440	16.26657	300.43976	15.33696	-21.56	292.25110	308.51767
10.00	291.87485	308.87378	300.37433	16.99893	300.43921	15.45112	-26.52	291.87485	308.87378
20.00	291.26044	309.46613	300.36328	18.20569	300.43802	15.49878	-38.00	291.26044	309.46613
30.00	290.81491	309.87326	300.34409	19.05835	300.43771	15.50194	-48.48	290.81491	309.87326
40.00	290.41357	310.14786	300.28070	19.73428	300.43771	15.50218	-55.38	290.41357	310.14786

BAND(MHZ) 294.200 306.200

LMIN(DB) -0.18

LMAX(DB) 0.21

LDEL(DB) 0.39

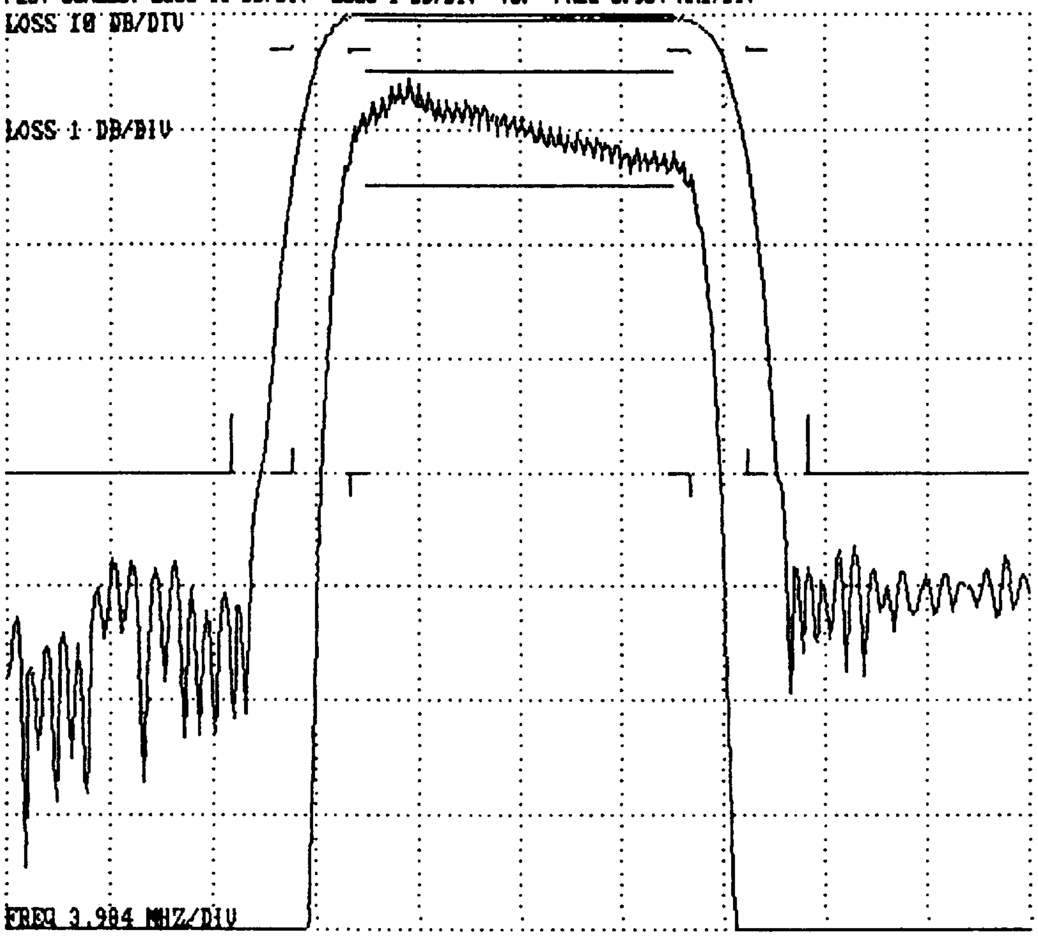
PMIN(DEG) -2976.61

PMAX(DEG) 2981.73

PDEL(DEG) 5958.34

File: 2AC8B06A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION
FILE=2CC8B06A.DAT 14:30:11 05-12-1998
PN_100830_824 FINAL_FUNCTIONAL TEMP:C FLIGHT6_3FUNCT /N DUAL_SXX
05-12-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 344.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 28.82521 PHASE(DEG)=-51947.43 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .201766 PHASE(DEG)= 1714.693
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV



PEAK: LEVEL(DB)= 28.39035 FREQ(MHZ)= 339.8784 DELAY(US)=-1.379629 SIDELOBE(DB)=-46.89098
ENERGY: LEVEL(DB)= 29.04133 CENTER(MHZ)= 344.0763 WIDTH(MHZ)= 16.26221 SKEW(MHZ)= .2621273

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.43	339.87839	339.87839	339.87839	0.00000	339.87839	0.00000	0.00	339.87839	339.87839
0.50	337.24796	350.97290	344.11041	13.72495	343.99216	13.61276	-11.49	337.24796	350.97290
1.00	336.98633	351.33887	344.16260	14.35254	343.99866	14.21640	-13.09	336.98633	351.33887
2.00	336.68854	351.73486	344.21170	15.04633	344.04907	14.64575	-14.79	336.68854	351.73486
3.00	336.46558	351.97580	344.22070	15.51022	344.05310	14.92313	-16.48	336.46558	351.97580
4.00	336.28558	352.15637	344.22098	15.87079	344.08289	15.08725	-17.96	336.28558	352.15637
5.00	336.13940	352.31924	344.22931	16.17984	344.06076	15.21656	-19.68	336.13940	352.31924
6.00	336.02045	352.45151	344.23596	16.43106	344.06366	15.28355	-20.95	336.02045	352.45151
10.00	335.63083	352.84988	344.24036	17.21906	344.07761	15.42000	-26.35	335.63083	352.84988
20.00	335.00183	353.47656	344.23920	18.47473	344.07654	15.46854	-37.10	335.00183	353.47656
30.00	334.51733	353.91528	344.21631	19.39795	344.07620	15.47220	-45.89	334.51733	353.91528
40.00	334.09418	354.22858	344.16138	20.13440	344.07620	15.47255	-50.39	334.09418	354.22858

BAND(MHZ) 338.200 350.200
LMIN(DB) -0.43
LMAX(DB) 0.38
LDEL(DB) 0.81
PMIN(DEG) -2937.43
PMAX(DEG) 2942.64
PDEL(DEG) 5880.07
File: 2CC8B06A.DAT Passband Symmetry = 0.3 dB

ELECTRICAL TEST DATA SHEET

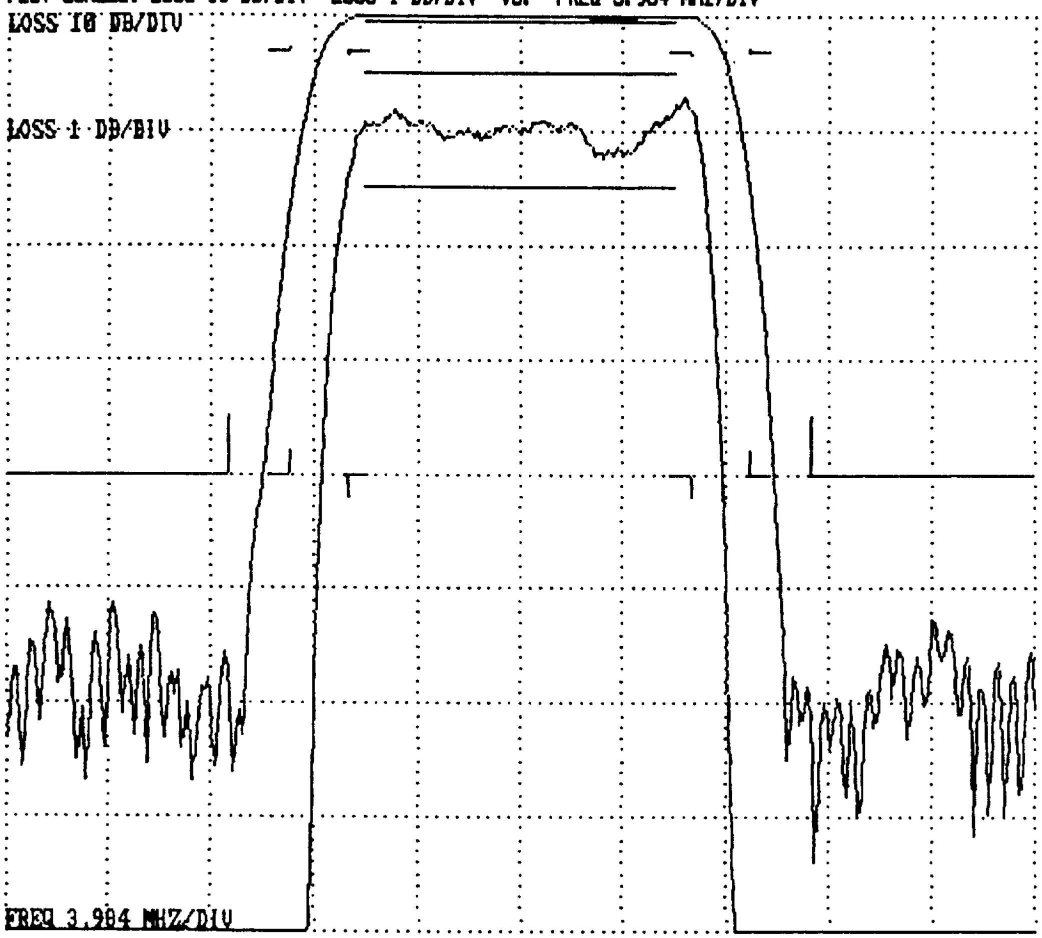
AEROJET PART: 1331576-2 PHONON PART: 100824 SERIAL: B06
TESTED BY: 210 TITLE: [illegible] DATE: 5/12/98 TIME: 11:00 AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A04374 CAL DUE: 1/29/99
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	14.9 C		P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 299.335/301.065 MHz	300.266 MHz		P
		HI: 343.335/345.065 MHz	344.079 MHz		P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 15/16 MHz	15.428 MHz		P
		HI: 15/16 MHz	15.500 MHz		P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.1 dB		P
		HI: /0.5 dB	0.2 dB		P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		294.2-306.2 MHz: /1.0 dB	0.4 dB		P
		338.2-350.2 MHz: /1.0 dB	0.6 dB		P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.6 dB		P
		HI: 27.8/30.2 dB	28.8 dB		P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.0 dB		P
		HI: -0.4/0.4 dB	0.0 dB		P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.3 dB		P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-286,359-1000 MHz:	44.8	0.000	
		DUAL: 286.000-288.935, 311.465-332.935, 355.465-359.00 MHz:	46.8	0.000	
		PEAK: 35.0/ dB	44.8 dB		P
		WIDTH: /3.2 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.28 Unitless		P
		HI: /1.30 Unitless	1.30 Unitless		P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		294.2-306.2,338.2-350.2 MHz			
		DUAL S11: 7.5/ dB	16.9 dB		P
		DUAL S22: 7.5/ dB	8.5 dB		P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.2/0.2 MHz	-0.016 MHz		P
		3 dB BANDWIDTH: -0.32/0.32 MHz	+0.003 MHz		P
		INSERTION LOSS: -0.5/0.5 dB	+0.1 dB		P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P DP		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION
FILE=2AR8B06A.DAT 14:44:03 05-12-1998
PN_100830_824 FINAL_FUNCTIONAL TEMP:R FLIGHT6_3FUNCT /N DUAL_SXX
05-12-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 300.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 28.56445 PHASE(DEG)= 40447.72 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 9.621572E-02 PHASE(DEG)= 1737.785
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV



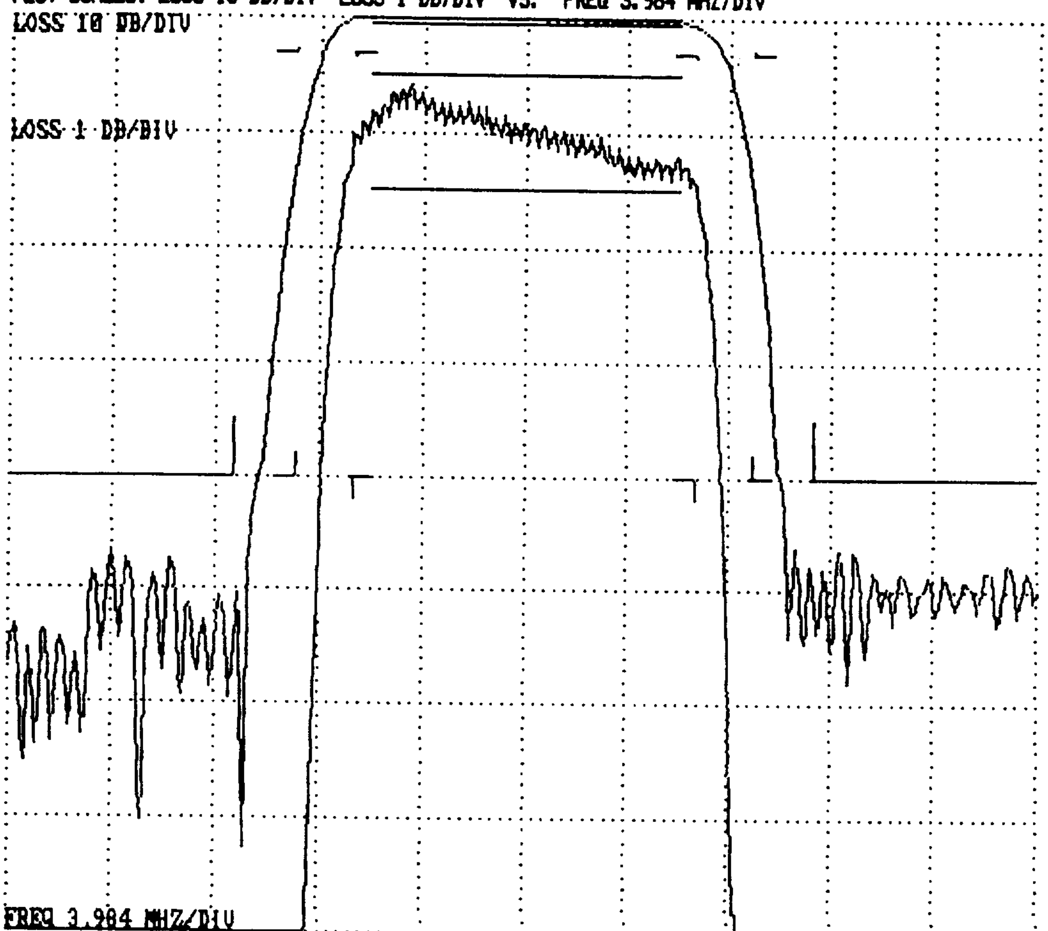
PEAK: LEVEL(DB)= 28.26605 FREQ(MHZ)= 306.5536 DELAY(US)=-1.386202 SIDELOBE(DB)=-51.5357
ENERGY: LEVEL(DB)= 28.74206 CENTER(MHZ)= 300.2793 WIDTH(MHZ)= 16.13214 SKEW(MHZ)= 1.021874E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.30	306.55359	306.55359	306.55359	0.00000	306.55359	0.00000	0.00	306.55359	306.55359
0.50	293.42606	307.33371	300.37988	13.90765	300.37955	13.92111	-12.21	293.42606	307.33371
1.00	293.11984	307.51514	300.31750	14.39529	300.28076	14.32294	-13.42	293.11984	307.51514
2.00	292.76855	307.77960	300.27408	15.01105	300.32455	14.75382	-15.33	292.76855	307.77960
3.00	292.55176	307.97964	300.26569	15.42789	300.28671	14.96347	-16.72	292.55176	307.97964
4.00	292.38062	308.13348	300.25705	15.75287	300.28644	15.17791	-18.96	292.38062	308.13348
5.00	292.23944	308.26541	300.25244	16.02597	300.28583	15.25842	-20.22	292.23944	308.26541
6.00	292.11850	308.37827	300.24838	16.25977	300.28500	15.32257	-21.62	292.11850	308.37827
10.00	291.74420	308.73499	300.23959	16.99078	300.28232	15.43543	-26.60	291.74420	308.73499
20.00	291.13049	309.32541	300.22797	18.19492	300.27979	15.48234	-38.11	291.13049	309.32541
30.00	290.67957	309.72711	300.20334	19.04755	300.27933	15.48542	-48.67	290.67957	309.72711
40.00	290.26865	310.01599	300.14233	19.74734	300.27930	15.48565	-55.81	290.26865	310.01599

BAND(MHZ)	294.200	306.200
LMIN(DB)	-0.22	
LMAX(DB)	0.23	
LDEL(DB)	0.45	
PMIN(DEG)	-2978.17	
PMAX(DEG)	2983.00	
PDEL(DEG)	5961.17	

File: 2AR8B06A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION
FILE=2CR8B06A.DAT 14:45:06 05-12-1998
PN_100830_024 FINAL_FUNCTIONAL TEMP:R FLIGHT6_3FUNCT /N DUAL_SXX
05-12-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 344.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 28.82098 PHASE(DEG)= 19301.39 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .2053686 PHASE(DEG)= 1715.642
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV

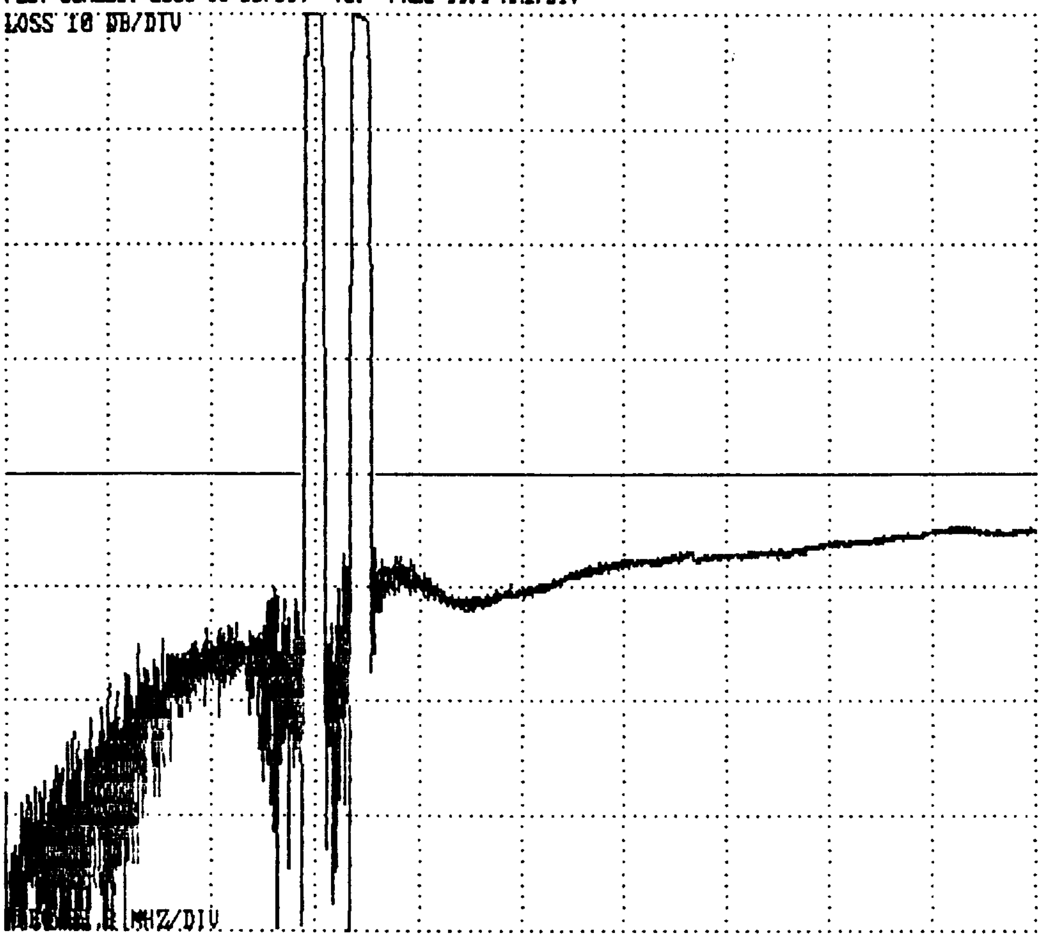


PEAK: LEVEL(DB)= 28.39487 FREQ(MHZ)= 339.725 DELAY(US)=-1.37586 SIDELOBE(DB)=-46.69956
ENERGY: LEVEL(DB)= 29.03154 CENTER(MHZ)= 343.938 WIDTH(MHZ)= 16.25291 SKEW(MHZ)= .2569103

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.43	339.72504	339.72504	339.72504	0.00000	339.72504	0.00000	0.00	339.72504	339.72504
0.50	337.10318	350.84775	343.97546	13.74457	343.81967	13.73567	-11.76	337.10318	350.84775
1.00	336.87363	351.20682	344.04022	14.33319	343.87872	14.23350	-13.12	336.87363	351.20682
2.00	336.55560	351.59006	344.07281	15.03445	343.92664	14.66385	-14.83	336.55560	351.59006
3.00	336.32895	351.82904	344.07898	15.50009	343.92804	14.93976	-16.53	336.32895	351.82904
4.00	336.15280	352.00793	344.08038	15.85513	343.93036	15.14960	-18.58	336.15280	352.00793
5.00	336.00211	352.17117	344.08664	16.16907	343.93130	15.23122	-19.74	336.00211	352.17117
6.00	335.88156	352.30002	344.09079	16.41846	343.93265	15.29779	-21.02	335.88156	352.30002
10.00	335.48999	352.69806	344.09402	17.20807	343.93567	15.42003	-25.53	335.48999	352.69806
20.00	334.85846	353.32346	344.09094	18.46500	343.93857	15.47947	-37.03	334.85846	353.32346
30.00	334.36130	353.76096	344.06113	19.39966	343.93796	15.48317	-45.70	334.36130	353.76096
40.00	333.92886	354.13693	344.03290	20.20807	343.93793	15.48352	-49.80	333.92886	354.13693

BAND(MHZ) 338.200 350.200
LMIN(DB) -0.41
LMAX(DB) 0.39
LDEL(DB) 0.80
PMIN(DEG) -2938.74
PMAX(DEG) 2945.54
PDEL(DEG) 5884.29
File: 2CR8B06A.DAT Passband Symmetry = 0.2 dB

PHONON CORPORATION
FILE=2ER8B06A.DAT 14:46:02 05-12-1998
PN_100830_824 FINAL_FUNCTIONAL TEMP:R FLIGHT6_3FUNCT /N WIDE_S21
05-12-1998 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 500.5 WIDTH= 999 INCR.= .208125 SYSTEM BANDWIDTH= 999
REFERENCES: LOSS(DB)= 28.69271 PHASE(DEG)=-10711.06 DELAY(US)= .1180667 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 13.09459 PHASE(DEG)= 10518.33
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV



PEAK: LEVEL(DB)= 28.24958 FREQ(MHZ)= 306.5353 DELAY(US)=-1.144218 SIDELOBE(DB)=-45.25919
ENERGY: LEVEL(DB)= 28.88329 CENTER(MHZ)= 321.5948 WIDTH(MHZ)= 32.36942 SKEW(MHZ)= 78.47002

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.44	306.53528	306.53528	306.53528	0.00000	306.53528	0.00000	0.00	306.53528	306.53528
0.50	293.34024	307.39410	300.36719	14.05386	300.38647	14.56427	-17.78	293.34024	350.58627
1.00	293.07202	307.56699	300.31952	14.49496	300.30072	14.74036	-17.83	293.07202	351.12366
2.00	292.74561	307.81180	300.27869	15.06619	300.30231	15.33827	-17.99	292.74561	351.55368
3.00	292.53058	308.00446	300.26752	15.47388	300.30035	15.55697	-18.05	292.53058	351.79633
4.00	292.36240	308.15228	300.25732	15.78989	300.25757	15.64144	-18.07	292.36240	351.98782
5.00	292.22559	308.28442	300.25500	16.05884	300.29684	15.71927	-18.09	292.22559	352.15002
6.00	292.10736	308.39725	300.25232	16.28989	300.26648	15.77819	-18.11	292.10736	352.28711
10.00	291.73688	308.74857	300.24274	17.01169	300.27817	15.92036	-18.14	291.73688	352.68976
20.00	291.12555	309.33514	300.23035	18.20959	300.28311	15.96728	-18.15	291.12555	353.31863
30.00	290.67816	309.73465	300.20642	19.05649	300.28342	15.96985	-18.15	290.67816	353.76273
40.00	290.26697	310.01794	300.14246	19.75098	300.28336	15.97003	-18.15	290.26697	354.16827

BAND(MHZ)	1.000	286.000	359.000	1000.000
LMIN(DB)	50.15	-0.44	44.82	
LMAX(DB)	103.20	81.43	52.27	
LDEL(DB)	53.05	81.87	7.45	
PMIN(DEG)	9999.00	-9659.89	-9412.14	
PMAX(DEG)	9999.00	9999.00	9999.00	
PDEL(DEG)	0.00	19658.89	19411.14	

FILE: 2ER8B06A.DAT Out-of-band Rejection: PEAK= 44.8 dB WIDTH= 0.000 MHz

PHONON CORPORATION

FILE=2FR8B06A.DAT 14:46:28 05-12-1998

PN_100830_824 FINAL_FUNCTIONAL TEMP:R FLIGHT6_3FUNCT /N DUAL_SXX

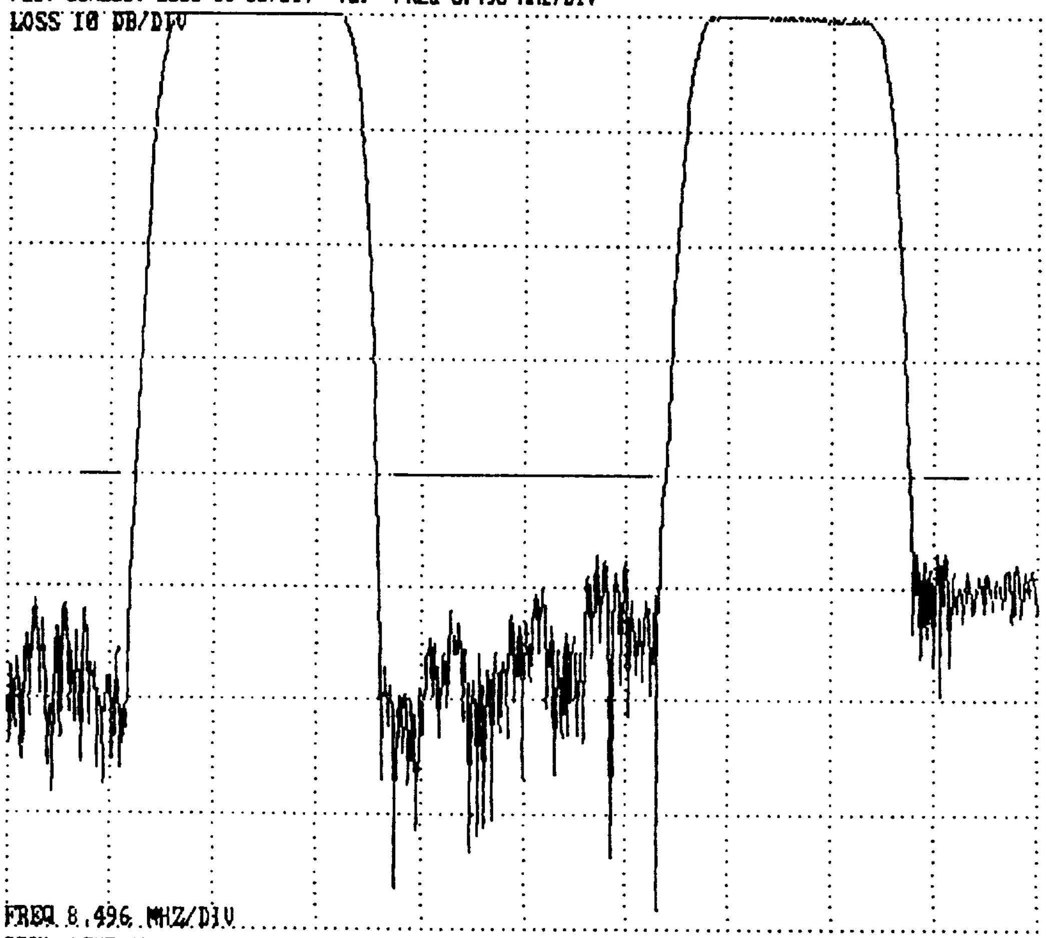
05-12-1998 HP8753,SSREF,SSREF

FREQUENCY(MHZ): CENTER= 322.2 WIDTH= 84.96 INCR.= .12 SYSTEM BANDWIDTH= 85

REFERENCES: LOSS(DB)= 28.69271 PHASE(DEG)= 29108.03 DELAY(US)= 1.268048 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= 26.89448 PHASE(DEG)= 1123.676

PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 8.496 MHZ/DIV



PEAK: LEVEL(DB)= 28.26507 FREQ(MHZ)= 306.561 DELAY(US)= 1.14987 SIDELOBE(DB)=-47.20171

ENERGY: LEVEL(DB)= 28.87959 CENTER(MHZ)= 321.4634 WIDTH(MHZ)= 32.34644 SKEW(MHZ)= 1.242795

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.43	306.56097	306.56097	306.56097	0.00000	306.56097	0.00000	0.00	306.56097	306.56097
0.50	293.34921	307.38181	300.36551	14.03259	300.36203	14.44706	-6.33	293.34921	350.78140
1.00	293.06491	307.55942	300.31216	14.49451	300.31271	14.75362	-6.38	293.06491	351.15607
2.00	292.73987	307.80563	300.27277	15.06577	300.31055	15.27299	-6.49	292.73987	351.55652
3.00	292.52786	307.99905	300.26346	15.47119	300.27682	15.47390	-6.52	292.52786	351.80392
4.00	292.36215	308.15057	300.25635	15.78842	300.27817	15.58457	-6.53	292.36215	351.98584
5.00	292.22437	308.28116	300.25275	16.05679	300.29846	15.71450	-6.55	292.22437	352.15335
6.00	292.10379	308.39233	300.24805	16.28854	300.27975	15.75087	-6.55	292.10379	352.28491
10.00	291.73380	308.74469	300.23926	17.01089	300.28030	15.88574	-6.54	291.73380	352.68759
20.00	291.12338	309.33038	300.22687	18.20700	300.27957	15.94522	-6.48	291.12338	353.31689
30.00	290.67389	309.73117	300.20251	19.05728	300.27933	15.94961	-6.43	290.67389	353.75867
40.00	290.26294	310.01898	300.14096	19.75604	300.27927	15.94987	-6.38	290.26294	354.11469

BAND(MHZ) 294.200 306.200 338.200 350.200

LMIN(DB)	-0.32	-0.42	-0.35
LMAX(DB)	0.10	78.46	0.53
LDEL(DB)	0.42	78.88	0.88
PMIN(DEG)	1061.07	-1126.46	37.45
PMAX(DEG)	1538.97	1055.85	439.13
PDEL(DEG)	477.91	2182.31	401.69

FILE: 2FR8B06A.DAT Out-of-band Rejection: PEAK= 46.8 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE: 2FR8B06A.DAT (+SSCF)
PN_100830_824 FINAL_FUNCTIONAL TEMP:R FLIGHT6_3FUNCT /N DUAL_SXX
05-12-1998 HP8753,SSREF,SSREF,SSCF
REFERENCES: LOSS(DB)= 28.69271 PHASE(DEG)= 29108.03
DELAY(US)= 1.268048 SLOPE(US/MHZ)= 0

BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY(MHZ)	LOSS(DB)	PHASE(DEG)
285.400	59.62	697.84
289.080	66.08	1555.35
292.760	1.90	1597.53
296.440	-0.21	1448.64
300.120	-0.12	1299.97
303.800	0.08	1152.43
307.480	0.78	1005.08
311.160	60.02	566.91
314.840	55.13	-17.88
318.520	58.75	-516.65
322.200	63.42	-970.99
325.880	60.76	-524.88
329.560	56.11	-180.27
333.240	53.72	654.13
336.920	1.10	483.79
340.600	0.03	358.53
344.280	0.20	234.13
347.960	0.46	108.57
351.640	2.34	-10.44
355.320	47.68	-56.83
359.000	48.99	1614.60

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-2 PHONON PART: 100824 SERIAL: B06

TESTED BY: 210 TITLE: test tech DATE: 5/12/98 TIME: 11:00 AM

TEST: FINAL FUNCTIONAL

EQUIPMENT: HP 8753D SERIAL: 3410A04374 CAL DUE: 1/29/99

HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	35.5	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 299.335/301.065 MHz	300.162	MHz	P
		HI: 343.335/345.065 MHz	343.974	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 15/16 MHz	15.422	MHz	P
		HI: 15/16 MHz	15.495	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.0	dB	P
		HI: /0.5 dB	0.2	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		294.2-306.2 MHz: /1.0 dB	0.4	dB	P
		338.2-350.2 MHz: /1.0 dB	0.6	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.8	dB	P
		HI: 27.8/30.2 dB	28.9	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.3	dB	P
		HI: -0.4/0.4 dB	0.1	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.1	dB	P

			PEAK(dB)	WIDTH(MHz)	P/F
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION BAND			
		WIDE: 1-286,359-1000 MHz:	44.1	0.000	
		DUAL: 286.000-288.935, 311.465-332.935, 355.465-359.00 MHz:	46.3	0.000	
		PEAK: 35.0/ dB	44.1 dB		P
		WIDTH: /3.2 MHz		0.000 MHz	P

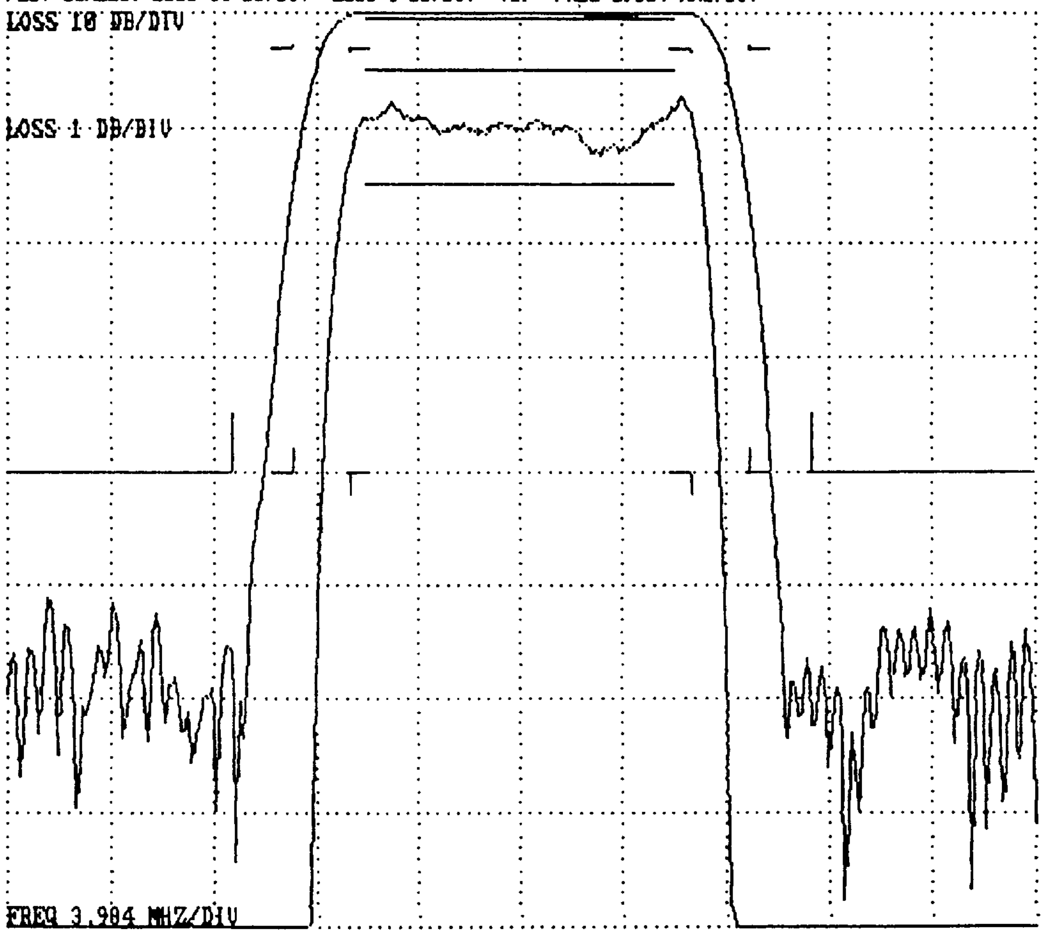
			DATA		P/F
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.28	Unitless	P
		HI: /1.30 Unitless	1.31	Unitless	F
3.2.1.14	5.2.12	VSWR (RETURN LOSS) 294.2-306.2,338.2-350.2 MHz			
		DUAL S11: 7.5/ dB	16.6	dB	P
		DUAL S22: 7.5/ dB	8.3	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.2/0.2 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.32/0.32 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P DP		

PASS PER AE-24937E ECN CAMSU-1550 SEE PLOT ON PROCEEDING PAGE

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION
FILE=2AH8B06A.DAT 14:59:26 05-12-1998
PN_100830_824 FINAL_FUNCTIONAL TEMP:H FLIGHT6_3FUNCT /N DUAL_SXX
05-12-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 300.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 28.82026 PHASE(DEG)= 56442.55 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1012031 PHASE(DEG)= 1738.342
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV

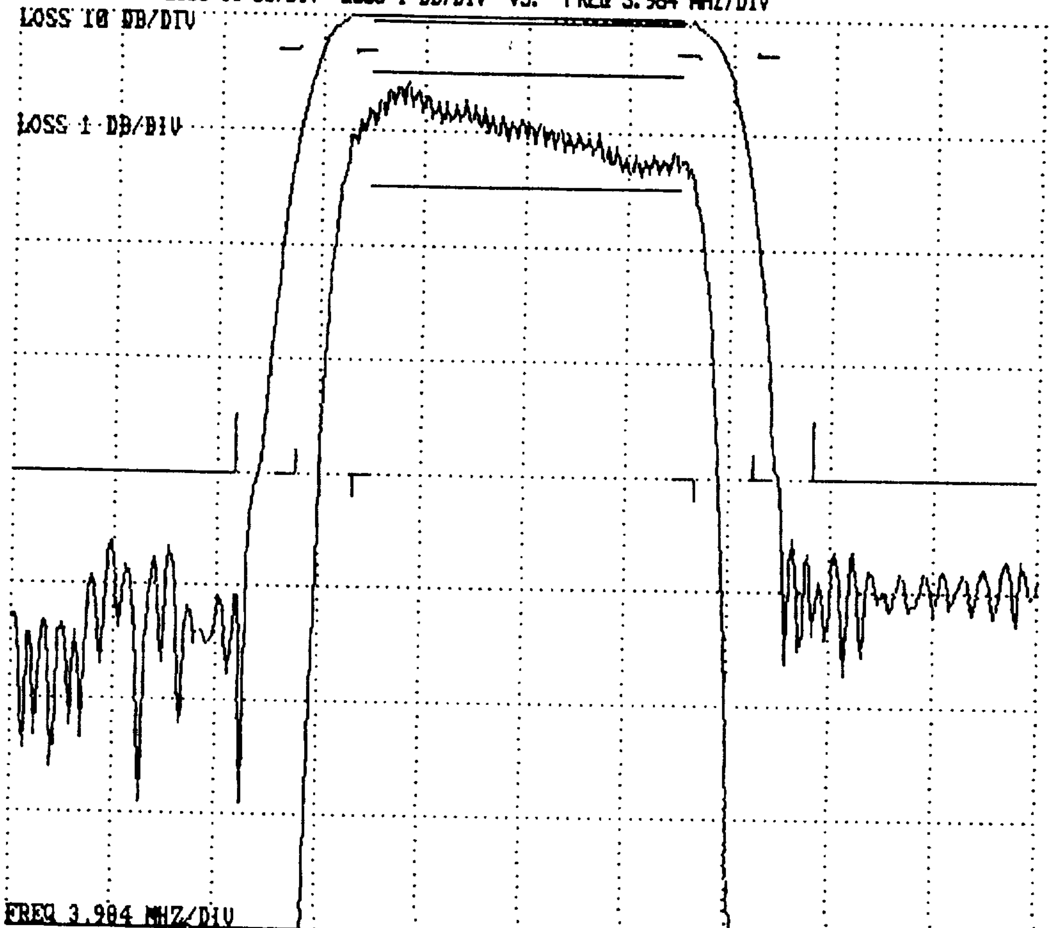


PEAK: LEVEL(DB)= 28.54959 FREQ(MHZ)= 306.4375 DELAY(US)=-1.387307 SIDELOBE(DB)=-51.36027
ENERGY: LEVEL(DB)= 28.99814 CENTER(MHZ)= 300.1562 WIDTH(MHZ)= 16.12538 SKEW(MHZ)= .0426966

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.27	306.43747	306.43747	306.43747	0.00000	306.43747	0.00000	0.00	306.43747	306.43747
0.50	293.30658	307.22101	300.26379	13.91443	300.24069	13.91804	-12.23	293.30658	307.22101
1.00	293.00742	307.40643	300.20691	14.39902	300.23895	14.32063	-13.44	293.00742	307.40643
2.00	292.66727	307.67416	300.17072	15.00690	300.18954	14.75184	-15.36	292.66727	307.67416
3.00	292.45071	307.87256	300.16162	15.42184	300.15375	14.95993	-16.75	292.45071	307.87256
4.00	292.27933	308.02713	300.15323	15.74780	300.15619	15.17362	-19.00	292.27933	308.02713
5.00	292.14120	308.15930	300.15027	16.01810	300.15692	15.25364	-20.28	292.14120	308.15930
6.00	292.02026	308.27167	300.14597	16.25140	300.15738	15.31737	-21.68	292.02026	308.27167
10.00	291.64603	308.62616	300.13611	16.98013	300.15741	15.42909	-26.70	291.64603	308.62616
20.00	291.03125	309.21466	300.12296	18.18341	300.15646	15.47500	-38.27	291.03125	309.21466
30.00	290.58182	309.61691	300.09937	19.03510	300.15616	15.47795	-48.65	290.58182	309.61691
40.00	290.15765	309.89984	300.02875	19.74219	300.15616	15.47818	-55.38	290.15765	309.89984

BAND(MHZ) 294.200 306.200
LMIN(DB) -0.22
LMAX(DB) 0.23
LDEL(DB) 0.45
PMIN(DEG) -2979.12
PMAX(DEG) 2983.83
PDEL(DEG) 5962.95
File: 2AH8B06A.DAT Passband Symmetry = 0.0 dB

PHONON CORPORATION
FILE=2CH8B06A.DAT 15:00:20 05-12-1998
PN_100830_824 FINAL_FUNCTIONAL TEMP:H FLIGHT6_3FUNCT /N DUAL_SXX
05-12-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 344.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 28.88186 PHASE(DEG)= 37448.92 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .2053115 PHASE(DEG)= 1716.353
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV



PEAK: LEVEL(DB)= 28.45248 FREQ(MHZ)= 339.5984 DELAY(US)=-1.375526 SIDELOBE(DB)=-45.74779
ENERGY: LEVEL(DB)= 29.08671 CENTER(MHZ)= 343.8371 WIDTH(MHZ)= 16.24485 SKEW(MHZ)= .252331

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MH
-0.43	339.59839	339.59839	339.59839	0.00000	339.59839	0.00000	0.00	339.59839	339.59
0.50	336.99670	350.75058	343.87366	13.75388	343.70544	13.75045	-11.76	336.99670	350.75
1.00	336.78433	351.10410	343.94421	14.31976	343.81372	14.15593	-12.82	336.78433	351.10
2.00	336.45370	351.48340	343.96857	15.02969	343.81763	14.68211	-14.86	336.45370	351.48
3.00	336.22696	351.72150	343.97424	15.49454	343.82117	14.95707	-16.57	336.22696	351.72
4.00	336.05148	351.89841	343.97495	15.84692	343.84955	15.11874	-18.05	336.05148	351.89
5.00	335.89752	352.06119	343.97937	16.16367	343.82715	15.24694	-19.80	335.89752	352.06
6.00	335.77689	352.18628	343.98157	16.40939	343.82919	15.31299	-21.09	335.77689	352.18
10.00	335.38702	352.58292	343.98499	17.19589	343.83374	15.43369	-25.60	335.38702	352.58
20.00	334.75281	353.20782	343.98032	18.45502	343.83755	15.49223	-37.13	334.75281	353.20
30.00	334.24854	353.63867	343.94360	19.39014	343.83707	15.49584	-45.66	334.24854	353.63
40.00	333.83890	354.08450	343.96170	20.24561	343.83701	15.49619	-49.79	333.83890	354.08

BAND(MHZ)	338.200	350.200
LMIN(DB)	-0.41	
LMAX(DB)	0.37	
LDEL(DB)	0.79	
PMIN(DEG)	-2939.24	
PMAX(DEG)	2946.08	
PDEL(DEG)	5885.32	

File: 2CH8B06A.DAT Passband Symmetry = 0.2 dB

Report No. 11491
June 1999

Channel 13 Bandpass Filter

SAW Filter (S/N: 1331576-3, S/N: B07)

ELECTRICAL TEST DATA SHEET

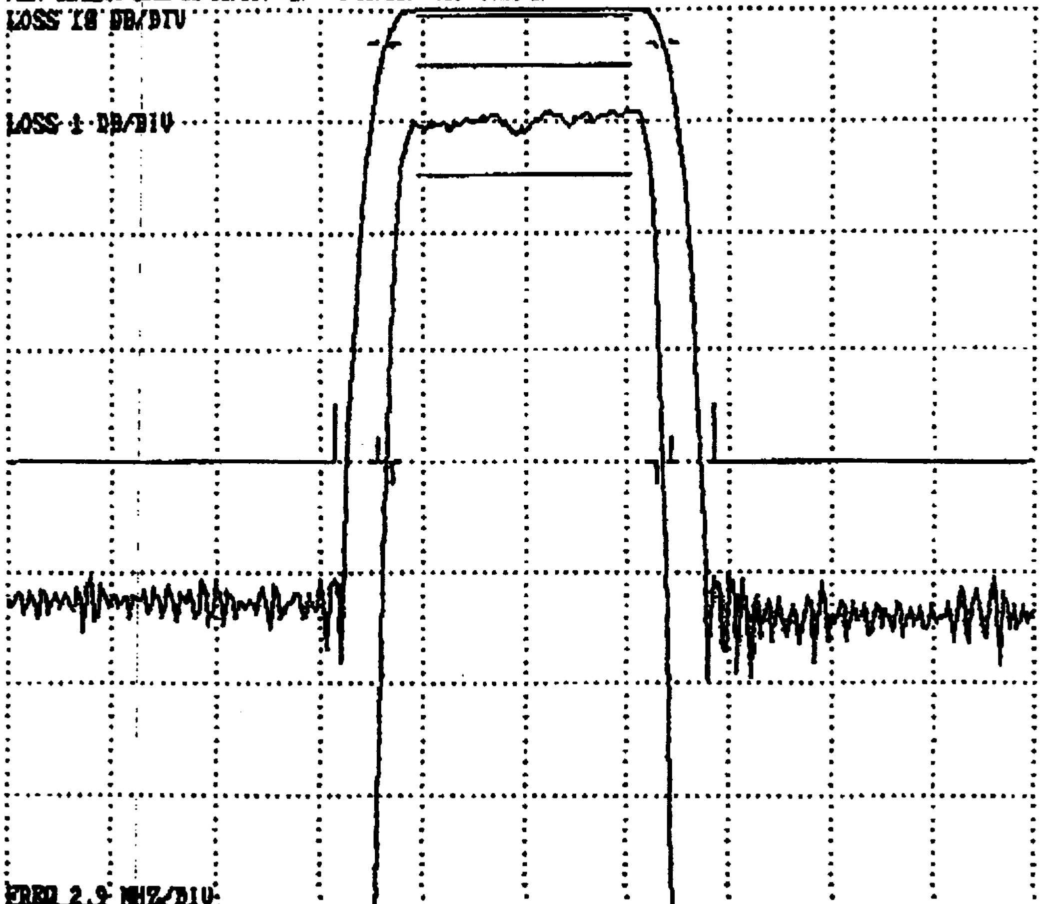
AEROJET PART: 1331576-3 PHONON PART: 100825 SERIAL: 007
TESTED BY: 210 TITLE: Test tech DATE: 6/15/99 TIME: 6:30 pm
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A04374 CAL DUE: 1/29/99
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	-4.6 C		P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 312.035/312.365 MHz	312.195 MHz		P
		HI: 332.035/332.365 MHz	332.142 MHz		P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 7.0/8.0 MHz	7.846 MHz		P
		HI: 7.0/8.0 MHz	7.861 MHz		P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.1 dB		P
		HI: /0.5 dB	0.1 dB		P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		309.2-315.2 MHz: /1.0 dB	0.2 dB		P
		329.2-335.2 MHz: /1.0 dB	0.2 dB		P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.6 dB		P
		HI: 27.8/30.2 dB	28.5 dB		P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	-0.2 dB		P
		HI: -0.4/0.4 dB	-0.2 dB		P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.0 dB		P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-303,342-1000 MHz:	44.2	0.000	
		DUAL: 303.000-306.835, 317.565-326.835, 337.565-342.00 MHz:	40.4	0.000	
		PEAK: 35.0/ dB	44.2 dB		P
		WIDTH: /1.6 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.27 Unitless		P
		HI: /1.30 Unitless	1.27 Unitless		P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		309.2-315.2,329.2-335.2 MHz			
		DUAL S11: 7.5/ dB	8.8 dB		P
		DUAL S22: 7.5/ dB	10.6 dB		P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	0 MHz		P
		3 dB BANDWIDTH: -0.16/0.16 MHz	0 MHz		P
		INSERTION LOSS: -0.5/0.5 dB	0 dB		P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P OP		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION
FILE=30CA007A.DAT 10:23:56 06-16-1998
PN_100632_025 FINAL_FUNCTIONAL TEMP:C FL30H7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 312.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.57795 PHASE(DEG)= 5354.252 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 4.092336E-02 PHASE(DEG)= 1647.187
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV

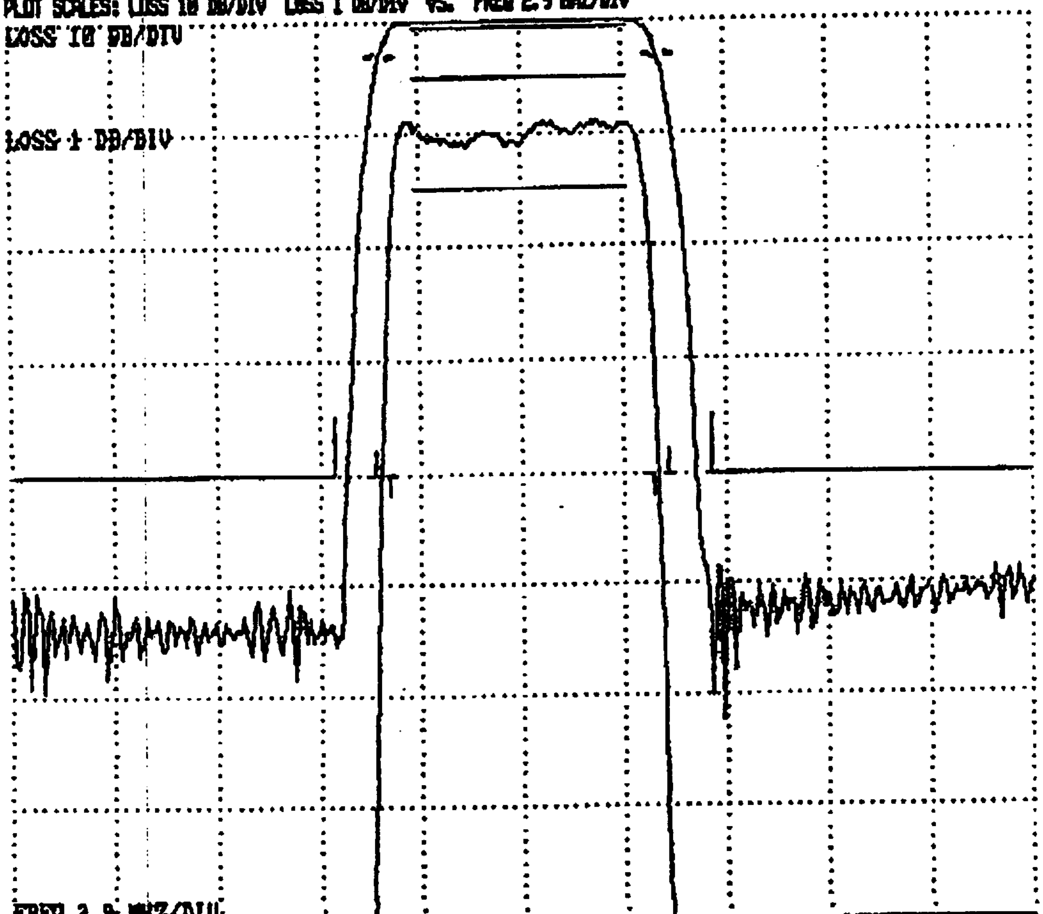


PEAK: LEVEL(DB)= 28.47162 FREQ(MHZ)= 315.1225 DELAY(US)=-2.689073 SIDELOBE(DB)=-58.33591
ENERGY: LEVEL(DB)= 28.76982 CENTER(MHZ)= 312.2898 WIDTH(MHZ)= 8.22366 SKEW(MHZ)=-2.470815E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.11	315.12247	315.12247	315.12247	0.00000	315.12247	0.00000	0.00	315.12247	315.12247
0.50	308.66943	315.76224	312.21582	7.09280	312.21625	7.00014	-14.46	308.66943	315.76224
1.00	308.54489	315.86734	312.20612	7.32245	312.21692	7.25875	-15.47	308.54489	315.86734
2.00	308.37830	316.01401	312.19617	7.63571	312.21600	7.53346	-18.07	308.37830	316.01401
3.00	308.27237	316.11853	312.19543	7.84616	312.21500	7.63974	-19.69	308.27237	316.11853
4.00	308.18619	316.20303	312.19461	8.01685	312.21423	7.72144	-21.57	308.18619	316.20303
5.00	308.11343	316.26855	312.19098	8.15512	312.21423	7.72144	-21.54	308.11343	316.26855
6.00	308.04858	316.32825	312.18842	8.27966	312.21300	7.77935	-23.72	308.04858	316.32825
10.00	307.85815	316.52353	312.19086	8.66537	312.21189	7.84330	-29.13	307.85815	316.52353
20.00	307.54453	316.82941	312.18695	9.28488	312.20999	7.86658	-48.52	307.54453	316.82941
30.00	307.33258	317.03830	312.18146	9.69772	312.20987	7.86803	-49.34	307.33258	317.03830
40.00	307.16833	317.17288	312.17017	10.00366	312.20904	7.86016	-52.68	307.16833	317.17288

BAND(MHZ) 309.200 315.200
LMIN(DB) -0.10
LMAX(DB) 0.12
LDEL(DB) 0.22
PMIN(DEG) -2806.39
PMAX(DEG) 2902.16
PDEL(DEG) 5708.54
File: 30C00070.DAT Passband Symmetry = 0.1 dB

FILE=3CCA0070.DAT 10:24:37 06-16-1998
PN_100032_025 FINAL_FUNCTIONAL TEMP:C FLIGHT7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSCF,SSFFIX,SSREF _
FREQUENCY(MHZ): CENTER= 332.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 20.53174 PHASE(DEG)=-4679.053 DELAY(US)= 0 SLOPE(DB/MHZ)= 0
RMS ERRORS: LOSS(DB)= 6.564653E-02 PHASE(DEG)= 1626.992
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV



PEAK: LEVEL(DB)= 20.40045 FREQ(MHZ)= 328.9394 DELAY(US)=-2.662374 SIDELOBE(DB)=-48.52859
ENERGY: LEVEL(DB)= 20.71095 CENTER(MHZ)= 332.1551 WIDTH(MHZ)= 8.224045 SKEW(MHZ)=-.0208154

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.13	328.93936	328.93936	328.93936	0.00000	328.93936	0.00000	0.00	328.93936	328.93936
0.50	328.56595	335.69736	332.13165	7.13141	332.11408	7.05585	-14.41	328.56595	335.69736
1.00	328.45883	335.81271	332.13577	7.35388	332.15600	7.34882	-16.03	328.45883	335.81271
2.00	328.31400	335.96094	332.13745	7.64694	332.15540	7.49278	-17.31	328.31400	335.96094
3.00	328.21179	336.07285	332.14233	7.86105	332.15396	7.61279	-18.82	328.21179	336.07285
4.00	328.13803	336.15991	332.14899	8.02188	332.15305	7.70023	-20.61	328.13803	336.15991
5.00	328.06985	336.22888	332.14935	8.15903	332.15298	7.77864	-22.60	328.06985	336.22888
6.00	328.01083	336.29163	332.15125	8.28079	332.15298	7.77864	-22.66	328.01083	336.29163
10.00	327.82718	336.48880	332.15799	8.66162	332.15344	7.85769	-27.00	327.82718	336.48880
20.00	327.52899	336.79654	332.16278	9.26755	332.15475	7.88894	-38.73	327.52899	336.79654
30.00	327.34399	337.00882	332.17639	9.66483	332.15586	7.89138	-49.73	327.34399	337.00882
40.00	327.17374	337.13425	332.15399	9.96051	332.15583	7.89147	-52.04	327.17374	337.13425

BAND(MHZ)	329.200	335.200
LMIN(DB)	-0.11	
LMAX(DB)	0.11	
LDEL(DB)	0.23	
PMIN(DEG)	-2771.23	
PMAX(DEG)	2866.78	
PDEL(DEG)	5638.02	

File: 3CCA0070.DAT Passband Symmetry = 0.1 dB

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-3 PHONON PART: 100825 SERIAL: 007
TESTED BY: 270 TITLE: Test Tech DATE: 6/15/98 TIME: 4:38pm
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A04374 CAL DUE: 1/29/99
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

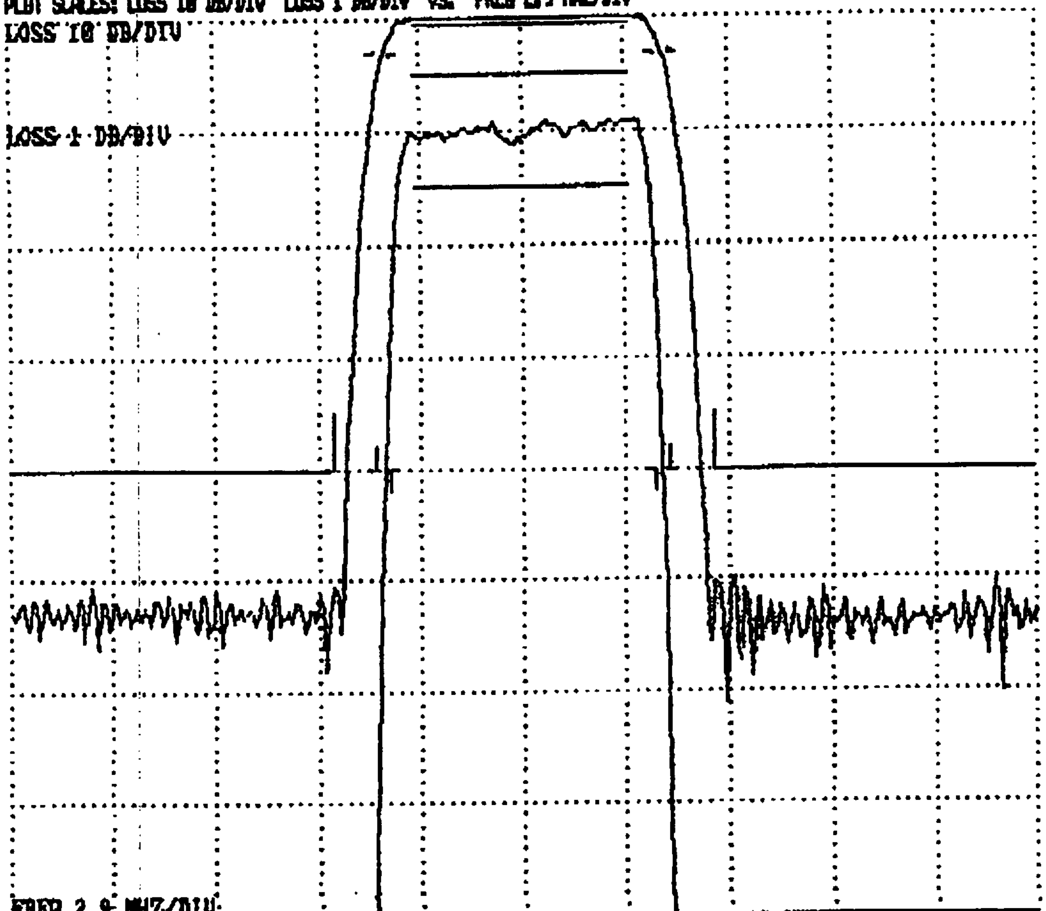
PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	14.6 C		P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 312.035/312.365 MHz	312.212 MHz		P
		HI: 332.035/332.365 MHz	332.156 MHz		P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 7.6/8.0 MHz	7.848 MHz		P
		HI: 7.6/8.0 MHz	7.868 MHz		P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.2 dB		P
		HI: /0.5 dB	0.1 dB		P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		309.2-315.2 MHz: /1.0 dB	0.2 dB		P
		329.2-335.2 MHz: /1.0 dB	0.2 dB		P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.7 dB		P
		HI: 27.8/30.2 dB	28.7 dB		P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.0 dB		P
		HI: -0.4/0.4 dB	0.0 dB		P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.1 dB		P
3.2.1.11,	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-303,342-1000 MHz:	43.7	0.000	
		DUAL: 303.000-306.035, 317.565-326.035, 337.565-342.00 MHz:	47.0	0.000	
		PEAK: 35.0/ dB	43.7 dB		P
		WIDTH: /1.6 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.27 Unitless		P
		HI: /1.30 Unitless	1.27 Unitless		P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		309.2-315.2,329.2-335.2 MHz			
		DUAL S11: 7.5/ dB	6.9 dB		P
		DUAL S22: 7.5/ dB	10.0 dB		P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	±0.003 MHz		P
		3 dB BANDWIDTH: -0.16/0.16 MHz	±0.001 MHz		P
		INSERTION LOSS: -0.5/0.5 dB	0.1 dB		P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6T838
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION

FILE=30R0007A.DAT 10:35:24 06-16-1998
PN_100832_025 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /W DUAL_SXX
06-15-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 312.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.73848 PHASE(DEG)= 5371.648 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .0486599 PHASE(DEG)= 1647.087
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV

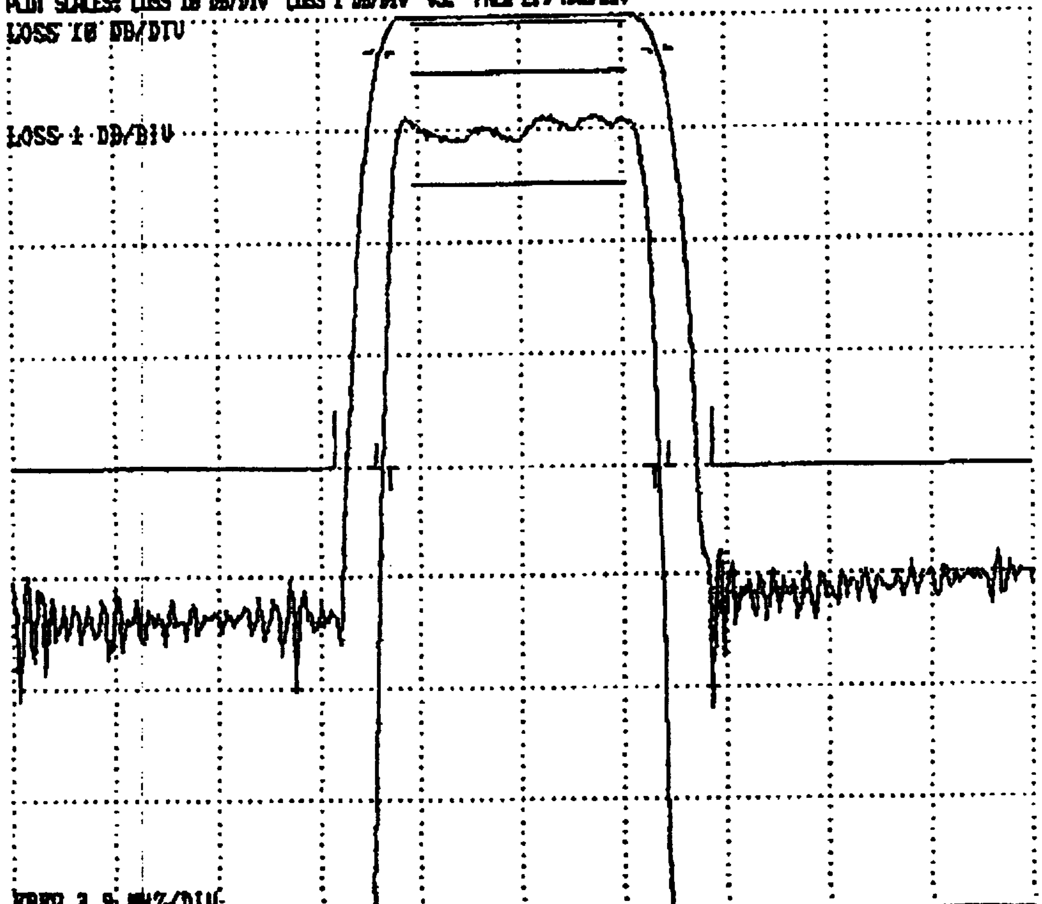


PEAK: LEVEL(DB)= 28.6358 FREQ(MHZ)= 315.329 DELAY(US)=-2.697751 SIDELOBE(DB)=-49.55531
ENERGY: LEVEL(DB)= 28.92988 CENTER(MHZ)= 312.2263 WIDTH(MHZ)= 8.223533 SKEW(MHZ)=-2.399447E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.10	315.32981	315.32981	315.32981	0.00000	315.32981	0.00000	0.00	315.32981	315.32981
0.50	308.68951	315.77637	312.23294	7.08685	312.21786	7.00062	-14.46	308.68951	315.77637
1.00	308.55814	315.88876	312.22345	7.33063	312.21967	7.25088	-15.47	308.55814	315.88876
2.00	308.39278	316.03009	312.21140	7.63739	312.22229	7.53417	-18.07	308.39278	316.03009
3.00	308.28772	316.13535	312.21155	7.84763	312.22339	7.64825	-19.60	308.28772	316.13535
4.00	308.20251	316.21771	312.21011	8.01520	312.24527	7.68258	-20.53	308.20251	316.21771
5.00	308.12921	316.28638	312.20779	8.15717	312.22455	7.72282	-21.54	308.12921	316.28638
6.00	308.06512	316.34473	312.20493	8.27968	312.22525	7.78079	-23.73	308.06512	316.34473
10.00	307.87460	316.54081	312.20731	8.66541	312.22586	7.84402	-29.13	307.87460	316.54081
20.00	307.56155	316.84601	312.20388	9.28445	312.22623	7.86725	-40.57	307.56155	316.84601
30.00	307.34799	317.04715	312.19757	9.69916	312.22629	7.86876	-49.36	307.34799	317.04715
40.00	307.18463	317.18216	312.18341	9.99753	312.22626	7.86888	-52.56	307.18463	317.18216

BAND(MHZ) 309.200 315.200
LMIN(DB) -0.10
LMAX(DB) 0.12
LDEL(DB) 0.21
PMIN(DEG) -2806.14
PMAX(DEG) 2901.97
PDEL(DEG) 5708.11
File: 3AR0007A.DAT Passband Symmetry = 0.2 dB

PHONON CORPORATION
FILE=3CR0087A.DAT 10:36:12 06-16-1998
PN_100032_025 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 332.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.68343 PHASE(DEG)=-4851.86 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .0641226 PHASE(DEG)= 1626.929
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV



PEAK: LEVEL(DB)= 28.55892 FREQ(MHZ)= 328.999 DELAY(US)=-2.65764 SIDELOBE(DB)=-47.98273
ENERGY: LEVEL(DB)= 28.86258 CENTER(MHZ)= 332.1673 WIDTH(MHZ)= 8.224294 SKEW(MHZ)=-1.932847E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.12	328.99899	328.99899	328.99899	0.00000	328.99899	0.00000	0.00	328.99899	328.99899
0.50	328.57431	335.70761	332.14096	7.13330	332.15097	7.18524	-14.93	328.57431	335.70761
1.00	328.47241	335.82703	332.14972	7.35461	332.15063	7.34924	-16.03	328.47241	335.82703
2.00	328.32687	335.97412	332.15051	7.64725	332.15057	7.49331	-17.31	328.32687	335.97412
3.00	328.22583	336.08683	332.15594	7.86000	332.15069	7.61319	-18.82	328.22583	336.08683
4.00	328.15178	336.17368	332.16269	8.02157	332.15948	7.70834	-20.68	328.15178	336.17368
5.00	328.08362	336.24521	332.16443	8.16159	332.16187	7.77866	-22.67	328.08362	336.24521
6.00	328.02396	336.30588	332.16492	8.28192	332.17474	7.80443	-23.76	328.02396	336.30588
10.00	327.84330	336.50158	332.17242	8.65811	332.16953	7.86792	-29.30	327.84330	336.50158
20.00	327.54199	336.80954	332.17578	9.26755	332.16745	7.89031	-40.84	327.54199	336.80954
30.00	327.35645	337.02267	332.18958	9.66623	332.16730	7.89173	-49.68	327.35645	337.02267
40.00	327.17917	337.14651	332.16284	9.96735	332.16727	7.89182	-51.84	327.17917	337.14651

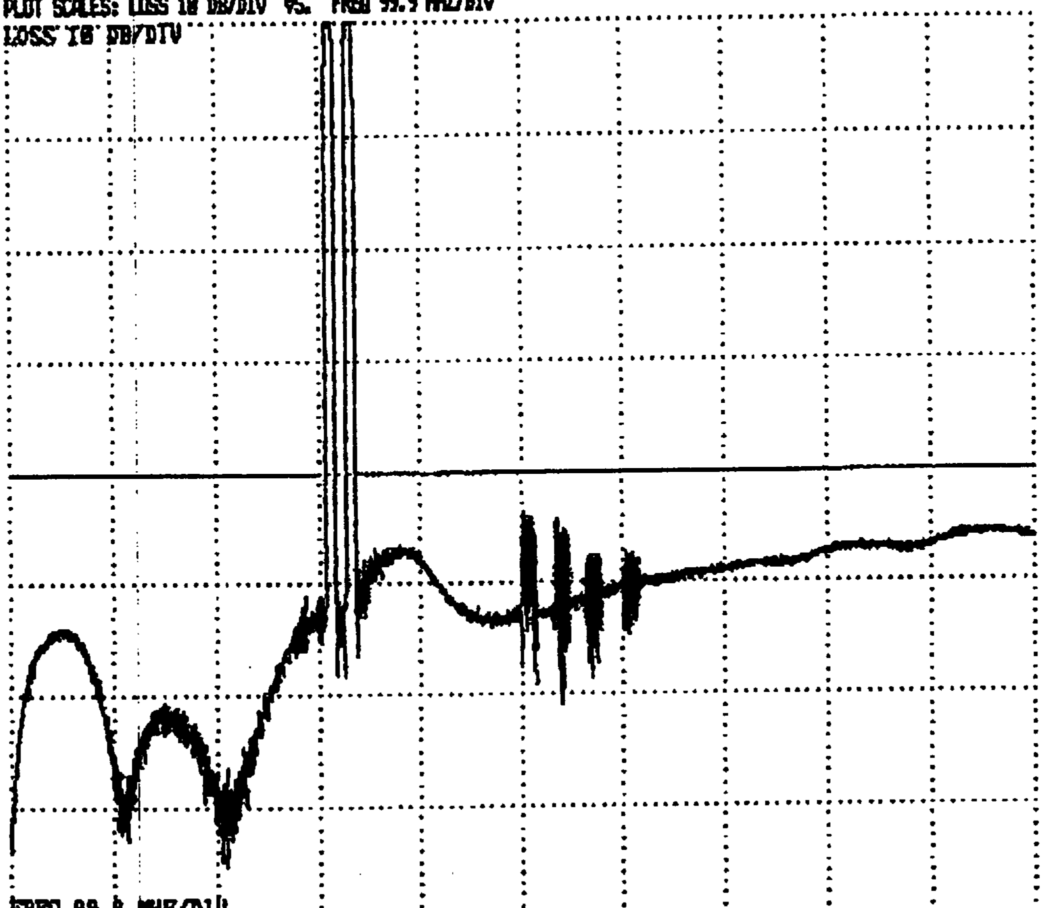
BAND(MHZ)	329.200	335.200
LMIN(DB)	-0.11	
LMAX(DB)	0.11	
LDEL(DB)	0.22	
PMIN(DEG)	-2771.16	
PMAX(DEG)	2866.71	
PDEL(DEG)	5637.87	

File: 3CR0087A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION

FILE=3ER0007A.DAT 10:36:56 06-16-1998
PH_100632_025 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /W WIDE_S21
06-15-1998 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 500.5 WIDTH= 999 INCR.= .200125 SYSTEM BANDWIDTH= 999
REFERENCES: LOSS(DB)= 20.71095 PHASE(DEG)=-3686.941 DELAY(US)= 4.767715 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 9.703694 PHASE(DEG)= 5108.623
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV

LOSS 10 DB/DIV



FREQ 99.9 MHZ/DIV

PEAK: LEVEL(DB)= 20.56365 FREQ(MHZ)= 328.999 DELAY(US)= 6.074722 SIDELOBE(DB)=-43.07063
ENERGY: LEVEL(DB)= 20.89961 CENTER(MHZ)= 322.5269 WIDTH(MHZ)= 16.4698 SKEW(MHZ)= 296.0757

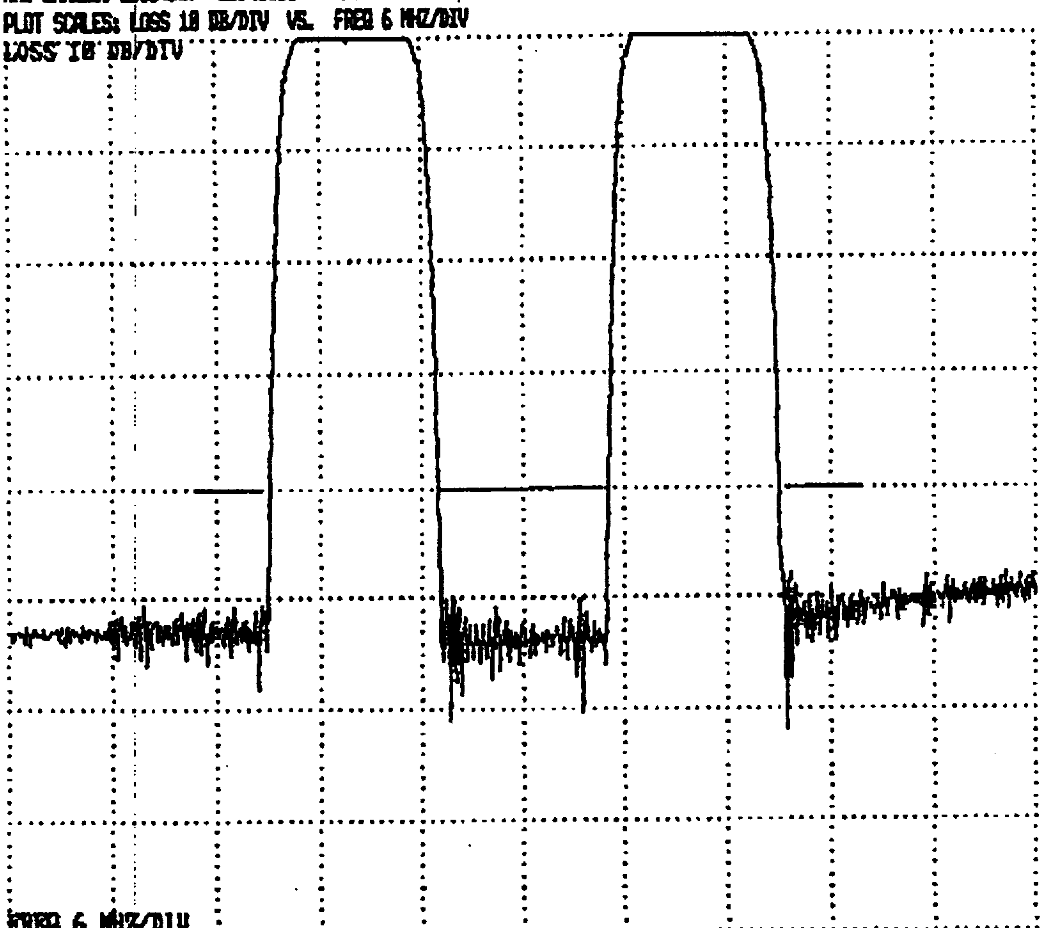
L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.15	328.99896	328.99896	328.99896	0.00000	328.99896	0.00000	0.00	328.99896	328.99896
0.50	328.56168	335.70929	332.13550	7.14761	332.13943	7.38285	-20.69	308.69544	335.70929
1.00	328.46014	335.83313	332.14664	7.37299	332.13943	7.38285	-20.69	308.56348	335.83313
2.00	328.32483	335.98218	332.15350	7.65735	332.14435	7.68579	-20.84	308.39545	335.98218
3.00	328.22461	336.08786	332.15625	7.86325	332.15846	7.71182	-20.90	308.28989	336.08786
4.00	328.14636	336.17383	332.16010	8.02747	332.15287	7.80175	-20.95	308.20444	336.17383
5.00	328.07898	336.24655	332.16276	8.16757	332.15287	7.80175	-20.95	308.13141	336.24655
6.00	328.02026	336.30044	332.16437	8.28018	332.16178	7.85886	-20.98	308.06635	336.30044
10.00	327.85114	336.50235	332.17676	8.65121	332.17172	7.92886	-21.01	307.67385	336.50235
20.00	327.54303	336.81976	332.18140	9.27673	332.16681	7.93942	-21.02	307.55878	336.81976
30.00	327.35867	337.00336	332.18103	9.64468	332.16730	7.94022	-21.02	307.35266	337.00336
40.00	327.17767	337.16882	332.17325	9.99115	332.16724	7.94042	-21.02	307.19450	337.16882

BAND(MHZ)	1.000	303.000	342.000	1000.000
LMIN(DB)		50.98	-0.15	43.73
LMAX(DB)		75.34	58.38	68.83
LBEL(DB)		24.36	58.52	17.10
PMIN(DEG)		-8609.22	-6784.83	-7861.16
PMAX(DEG)		-4419.96	6287.07	6185.05
PBEL(DEG)		4189.25	15071.90	13246.21

FILE: 3ER0007A.DAT Out-of-band Rejection: PEAK= 43.7 dB WIDTH= 0.000 MHz

PHONON CORPORATION

FILE=3FR0007A.DAT 10:37:15 06-16-1998
PN_100032_025 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 322.2 WIDTH= 60 INCR.= .1 SYSTEM BANDWIDTH= 60
REFERENCES: LOSS(DB)= 20.71095 PHASE(DEG)= 49.60936 DELAY(US)= 1.219755 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 23.46605 PHASE(DEG)= 1701.020
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 6 MHZ/DIV



PEAK: LEVEL(DB)= 20.55092 FREQ(MHZ)= 328.999 DELAY(US)=-.2180089 SIDELOBE(DB)=-47.86564
ENERGY: LEVEL(DB)= 20.89586 CENTER(MHZ)= 322.2746 WIDTH(MHZ)= 16.447 SKEW(MHZ)=-.1454319

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.15	328.99899	328.99899	328.99899	0.00000	328.99899	0.00000	0.00	328.99899	328.99899
0.50	328.56854	335.71579	332.14215	7.14725	332.15897	7.23892	-7.93	328.69861	335.71579
1.00	328.46725	335.83246	332.14984	7.36580	332.15863	7.39597	-0.08	328.56403	335.83246
2.00	328.32373	335.97760	332.15067	7.65387	332.15857	7.54094	-0.05	328.35563	335.97760
3.00	328.02342	336.08871	332.15607	7.86538	332.15869	7.66159	-0.09	328.29828	336.08871
4.00	328.14978	336.17587	332.16284	8.02609	332.15948	7.75734	-0.13	328.20468	336.17587
5.00	328.08191	336.24701	332.16446	8.16510	332.16107	7.82011	-0.16	328.13110	336.24701
6.00	328.02240	336.30734	332.16486	8.28494	332.17474	7.85485	-0.16	328.06580	336.30734
10.00	327.84235	336.50262	332.17249	8.66028	332.16953	7.91794	-0.17	327.87567	336.50262
20.00	327.54129	336.81024	332.17578	9.26895	332.16745	7.94047	-0.13	327.56216	336.81024
30.00	327.35602	337.02304	332.18951	9.66702	332.16730	7.94158	-0.18	327.34860	337.02304
40.00	327.17871	337.14682	332.16278	9.96811	332.16727	7.94159	-0.07	327.18408	337.14682

BAND(MHZ)	309.200	315.200	329.200	335.200
LMIN(DB)		-0.07	-0.15	-0.14
LMAX(DB)		0.14	60.95	0.08
LDEL(DB)		0.21	61.11	0.22
PMIN(DEG)		-1014.75	-2186.16	-2018.08
PMAX(DEG)		2102.71	2107.86	1829.03
PDEL(DEG)		3117.46	4294.02	3847.11

FILE: 3FR0007A.DAT Out-of-band Rejection: PEAK= 47.8 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE: 3FR0807A.DAT (+SSCF)
PN_100632_025 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /N DUAL_SCX
06-15-1998 HP8753,SSREF,SSREF,SSCF
REFERENCES: LOSS(DB)= 20.71055 PHASE(DEG)= 49.60936
DELAY(US)= 1.219755 SLOPE(US/MHZ)= 0

BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY(MHZ)	LOSS(DB)	PHASE(DEG)
304.600	54.02	2378.92
306.360	52.05	3151.98
308.120	5.16	2727.47
309.880	0.03	1795.40
311.640	0.06	866.15
313.400	0.07	-62.04
315.160	-0.05	-993.53
316.920	23.07	-1927.56
318.680	54.02	-1554.06
320.440	57.19	-689.55
322.200	52.07	-49.61
323.960	53.77	728.00
325.720	59.51	1487.20
327.480	22.70	1924.06
329.240	-0.06	1000.38
331.000	-0.02	99.26
332.760	-0.12	-809.39
334.520	-0.09	-1718.48
336.280	5.52	-2626.59
338.040	49.77	-2852.42
339.800	51.75	-2102.21

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-3 PHONON PART: 100825 SERIAL: 007
TESTED BY: 210 TITLE: Test Tech DATE: 6/15/99 TIME: 4:30pm
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A04374 CAL DUE: 1/29/99
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	35.0	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 312.035/312.365 MHz	312.219	MHz	P
		HI: 332.035/332.365 MHz	332.161	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 7.0/8.0 MHz	7.848	MHz	P
		HI: 7.0/8.0 MHz	7.859	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.2	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		309.2-315.2 MHz: /1.0 dB	0.2	dB	P
		329.2-335.2 MHz: /1.0 dB	0.2	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.0/30.2 dB	28.9	dB	P
		HI: 27.0/30.2 dB	28.8	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.1	dB	P
		HI: -0.4/0.4 dB	0.1	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.0	dB	P

PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	PEAK (dB)	WIDTH (MHz)	P/F
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK (dB)	WIDTH (MHz)	
		WIDE: 1-303,342-1000 MHz:	43.2	0.000	
		DUAL: 303.000-306.035, 317.565-326.035, 337.565-342.00 MHz:	47.9	0.000	
		PEAK: 35.0/ dB	43.2 dB		P
		WIDTH: /1.6 MHz		0.000 MHz	P

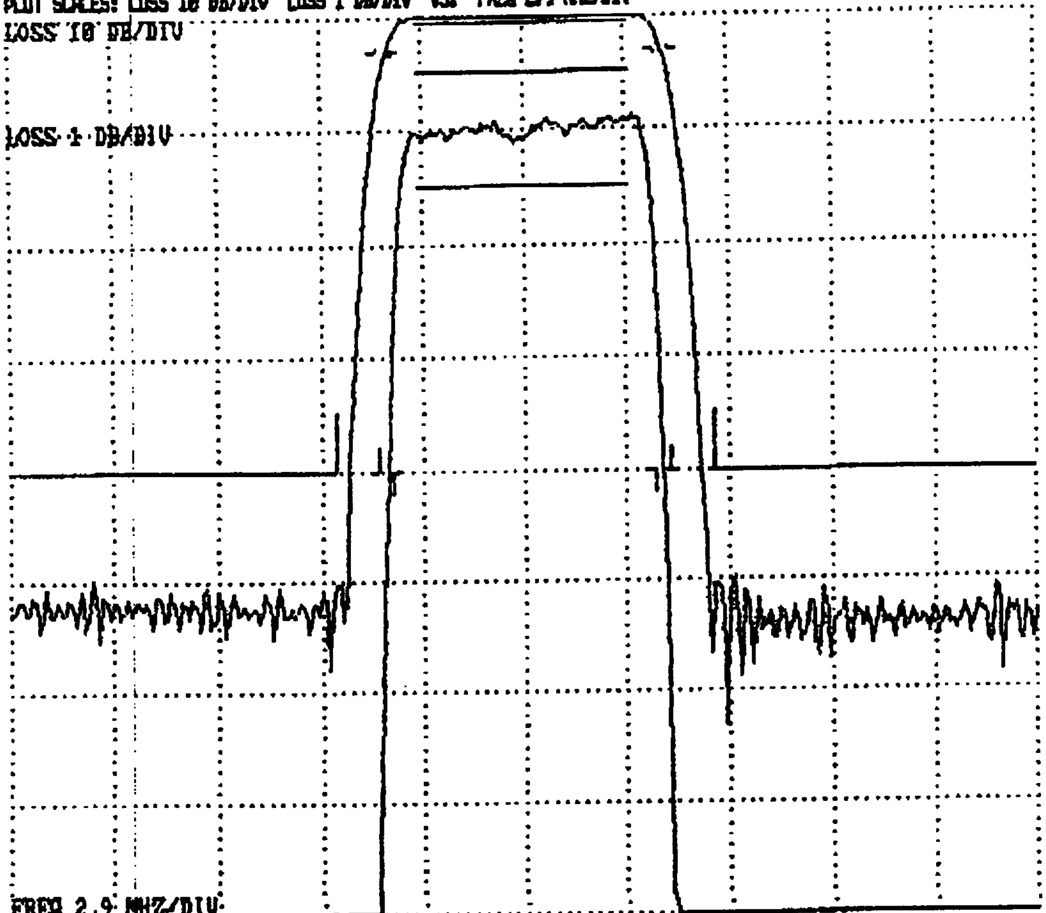
PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.27	Unitless	P
		HI: /1.30 Unitless	1.27	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		309.2-315.2,329.2-335.2 MHz			
		DUAL S11: 7.5/ dB	9.8	dB	P
		DUAL S22: 7.5/ dB	10.9	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			P
		CENTER FREQUENCY: -0.1/0.1 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.16/0.16 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P OP		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y058
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION

FILE=3AH0007A.DAT 10:47:06 06-16-1998
PN 100832_025 FINAL_FUNCTIONAL TEMP:H FLIGHT7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 312.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.87527 PHASE(DEG)= 5379.575 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 4.878436E-02 PHASE(DEG)= 1647.041
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV



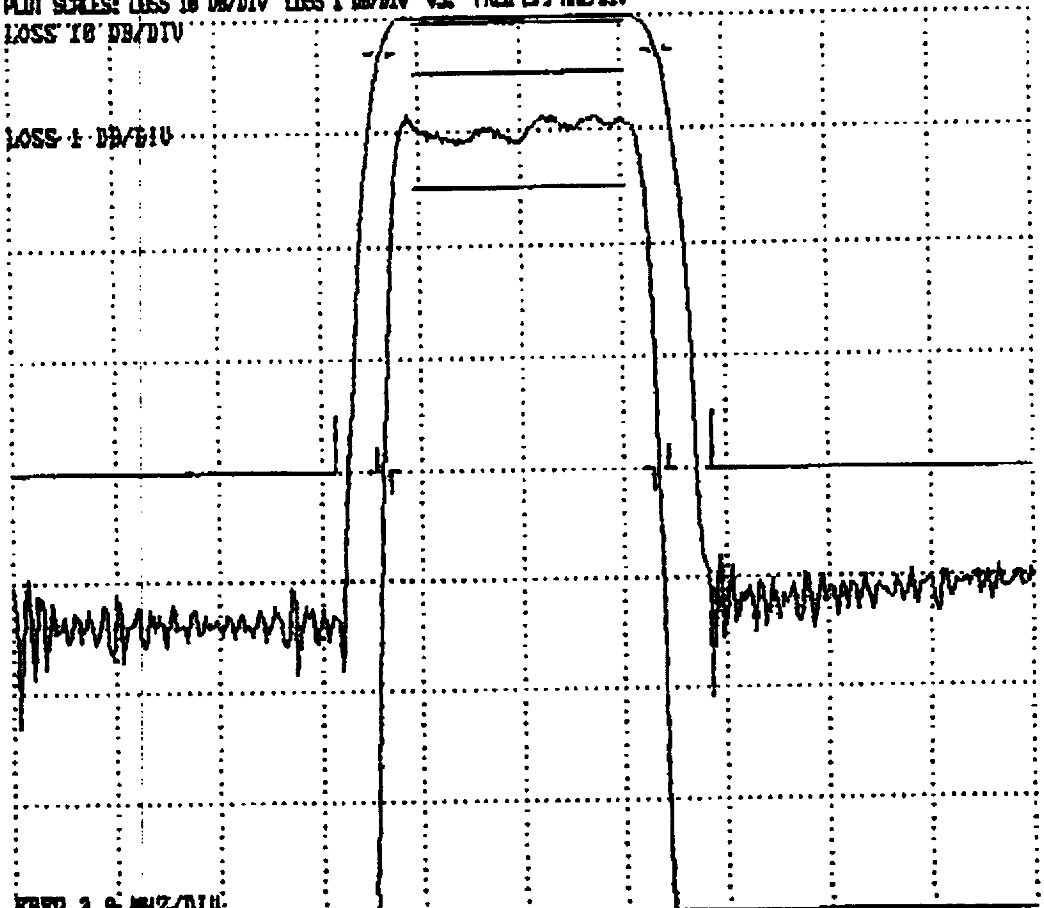
PEAK: LEVEL(DB)= 28.76938 FREQ(MHZ)= 315.3151 DELAY(US)=-2.697951 SIDELOBE(DB)=-49.67884
ENERGY: LEVEL(DB)= 29.06643 CENTER(MHZ)= 312.2338 WIDTH(MHZ)= 8.22353 SKEW(MHZ)=-2.532986E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.11	315.31512	315.31512	315.31512	0.00000	315.31512	0.00000	0.00	315.31512	315.31512
0.50	308.69641	315.77753	312.23697	7.08112	312.21942	7.00083	-14.46	308.69641	315.77753
1.00	308.56589	315.89679	312.23132	7.33090	312.22168	7.25072	-15.46	308.56589	315.89679
2.00	308.39828	316.03693	312.21759	7.63864	312.22574	7.53427	-18.86	308.39828	316.03693
3.00	308.29453	316.14252	312.21851	7.84799	312.22763	7.64046	-19.68	308.29453	316.14252
4.00	308.21045	316.22483	312.21722	8.01358	312.24991	7.68354	-20.55	308.21045	316.22483
5.00	308.13589	316.29401	312.21497	8.15811	312.22961	7.72223	-21.53	308.13589	316.29401
6.00	308.07175	316.35144	312.21161	8.27969	312.23182	7.78114	-23.73	308.07175	316.35144
10.00	307.88126	316.54688	312.21405	8.66562	312.23270	7.84437	-29.12	307.88126	316.54688
20.00	307.56808	316.85211	312.21008	9.28403	312.23367	7.86767	-40.55	307.56808	316.85211
30.00	307.35443	317.05438	312.20441	9.69995	312.23380	7.86918	-49.22	307.35443	317.05438
40.00	307.19077	317.18600	312.18839	9.99524	312.23388	7.86938	-52.25	307.19077	317.18600

BAND(MHZ) 309.200 315.200
LMIN(DB) -0.10
LMAX(DB) 0.11
LDEL(DB) 0.21
PMIN(DEG) -2806.08
PMAX(DEG) 2901.88
PDEL(DEG) 5707.96
File: 3AH0007A.DAT Passband Symmetry = 0.2 dB

PHONON CORPORATION

FILE=3CH0007A.DAT 10:47:48 06-16-1998
PN 100032 025 FINAL FUNCTIONAL TEMP:H FLIGHT7_3FUNCT /W DUAL_SXX
06-15-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 332.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.02911 PHASE(DEG)=-4854.6 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 6.479835E-02 PHASE(DEG)= 1626.913
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV



PEAK: LEVEL(DB)= 28.7083 FREQ(MHZ)= 329.0071 DELAY(US)=-2.657074 SIDELOBE(DB)=-40.06557
ENERGY: LEVEL(DB)= 29.00045 CENTER(MHZ)= 332.1731 WIDTH(MHZ)= 8.223777 SKEW(MHZ)=-2.022536E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.13	329.00700	329.00700	329.00700	0.00000	329.00700	0.00000	0.00	329.00700	329.00700
0.50	328.57928	335.70566	332.14447	7.13037	332.16031	7.10476	-14.93	328.57928	335.70566
1.00	328.47030	335.83295	332.15564	7.35464	332.16052	7.34670	-16.03	328.47030	335.83295
2.00	328.33524	335.97977	332.15750	7.64453	332.16092	7.49201	-17.31	328.33524	335.97977
3.00	328.23175	336.09076	332.16125	7.85901	332.16171	7.61265	-18.82	328.23175	336.09076
4.00	328.15723	336.17856	332.16791	8.02133	332.16315	7.70759	-20.60	328.15723	336.17856
5.00	328.08923	336.25003	332.16962	8.16080	332.16531	7.77700	-22.67	328.08923	336.25003
6.00	328.02930	336.31021	332.16974	8.28091	332.17923	7.80486	-23.79	328.02930	336.31021
10.00	327.84675	336.50586	332.17731	8.65710	332.17400	7.85723	-29.33	327.84675	336.50586
20.00	327.54721	336.81451	332.18085	9.26730	332.17316	7.88950	-40.91	327.54721	336.81451
30.00	327.36087	337.03140	332.19614	9.67053	332.17307	7.89050	-49.73	327.36087	337.03140
40.00	327.18359	337.15027	332.16693	9.96667	332.17303	7.89099	-51.98	327.18359	337.15027

BAND(MHZ) 329.200 335.200
LMIN(DB) -0.11
LMAX(DB) 0.12
LDEL(DB) 0.23
PMIN(DEG) -2771.10
PMAX(DEG) 2866.71
PDEL(DEG) 5637.89
File: 3CH0007A.DAT Passband Symmetry = 0.1 dB

Report No. 11491
June 1999

Channel 14 Bandpass Filter

SAW Filter (S/N: 1331576-4, S/N: B08)

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-4 PHONON PART: 100826 SERIAL: 008
TESTED BY: 210 TITLE: Test tech DATE: 6/15/98 TIME: 4:30pm
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A04374 CAL DUE: 1/29/99
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	-4.6	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 317.535/317.865 MHz	317.777	MHz	P
		HI: 326.535/326.865 MHz	326.776	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 2.8/3.0 MHz	2.932	MHz	P
		HI: 2.8/3.0 MHz	2.943	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.2	dB	P
		HI: /0.5 dB	0.0	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		316.575-318.825 MHz: /1.0 dB	0.7	dB	P
		325.575-327.825 MHz: /1.0 dB	0.6	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.1	dB	P
		HI: 27.8/30.2 dB	28.0	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	-0.1	dB	P
		HI: -0.4/0.4 dB	-0.2	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.1	dB	P

			PEAK(dB)	WIDTH(MHz)		P/F
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION BAND				
		WIDE: 1-313,331-1000 MHz:	44.9	0.000		
		DUAL: 313.000-315.585, 319.815-324.585, 328.815-331.0 MHz:	39.9	0.004		
		PEAK: 35.0/ dB	39.9 dB			P
		WIDTH: /0.6 MHz		0.004	MHz	P

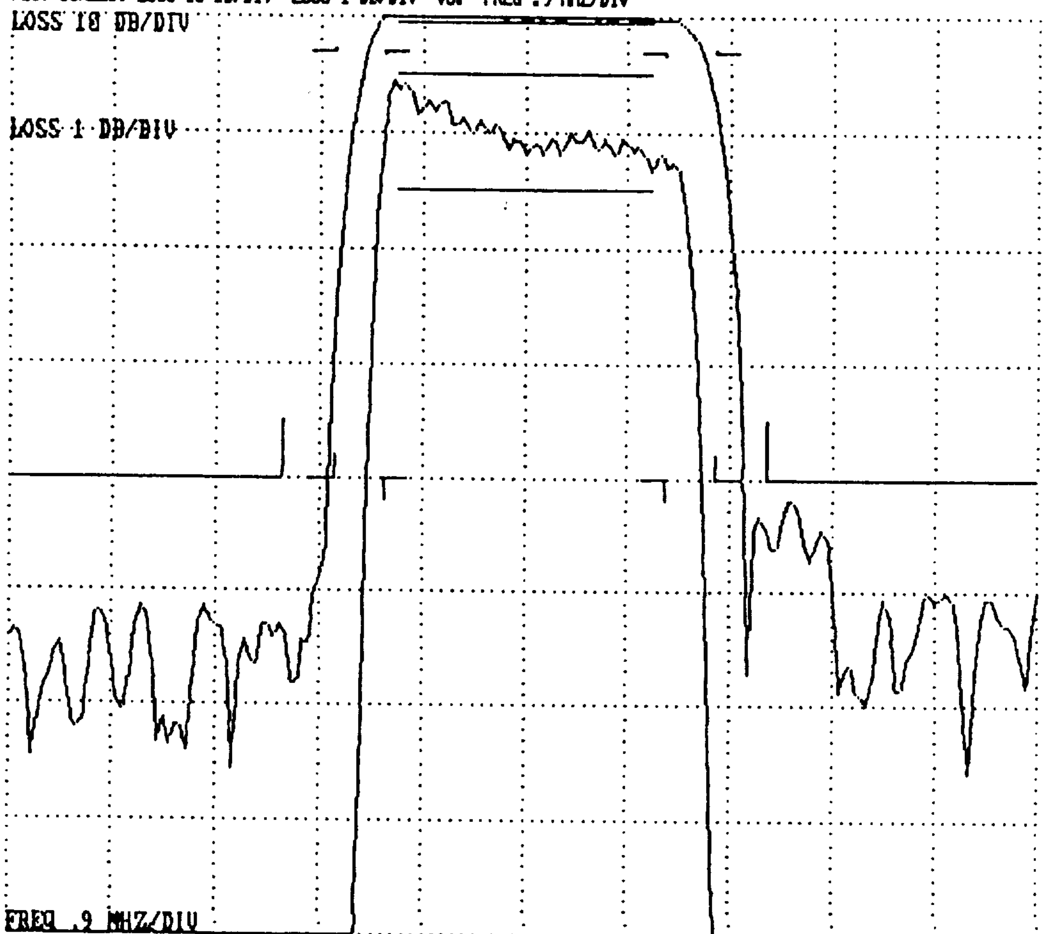
			DATA		P/F
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.24	Unitless	P
		HI: /1.30 Unitless	1.31	Unitless	F (P) (DP)
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		316.575-318.825,325.575-327.825 MHz			
		DUAL S11: 7.5/ dB	10.1	dB	P
		DUAL S22: 7.5/ dB	10.1	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.06/0.06 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P (DP)		

SEE EXPLANATION FOR WORST CASE AT +35 C

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

FILE=4AC8008A.DAT 10:26:42 06-16-1998
PN_100834_026 FINAL_FUNCTIONAL TEMP:C FLIGHT7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 317.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25
REFERENCES: LOSS(DB)= 28.06131 PHASE(DEG)= 4108.038 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1707484 PHASE(DEG)= 743.4666
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV

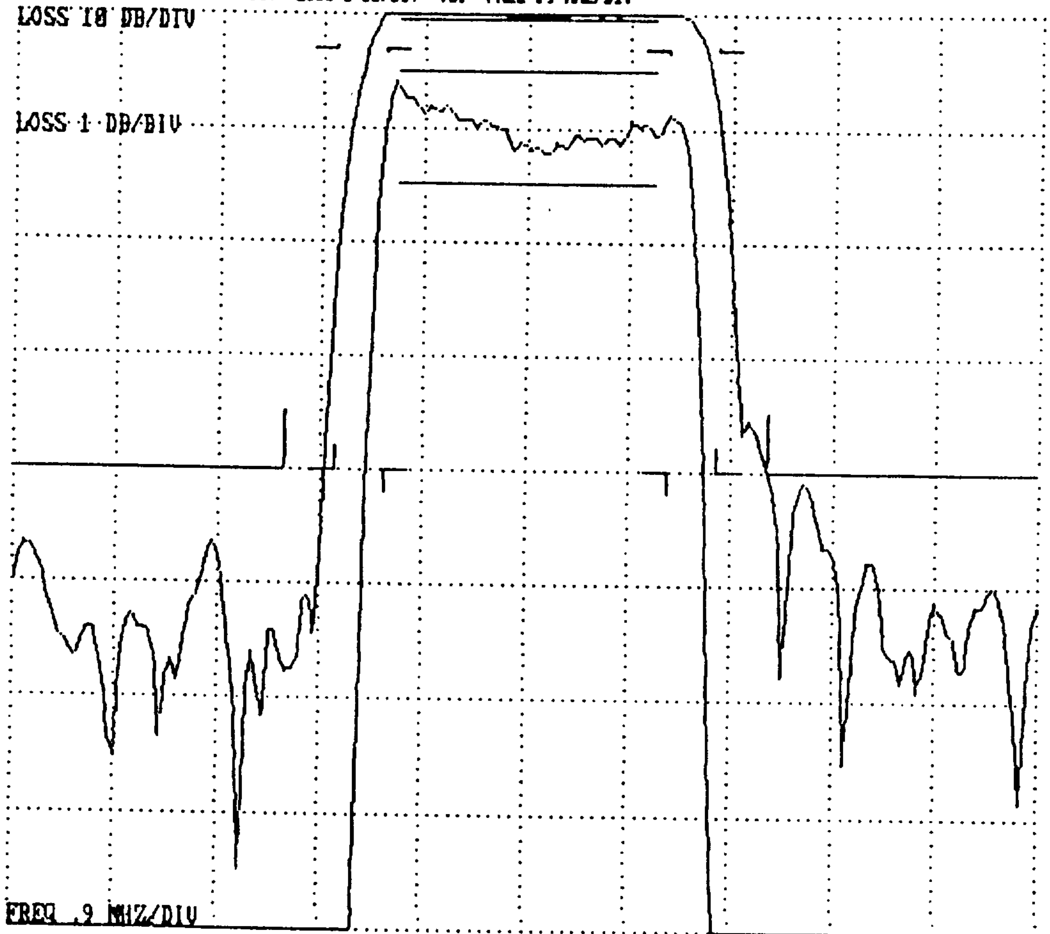


PEAK: LEVEL(DB)= 27.61308 FREQ(MHZ)= 316.5544 DELAY(US)=-3.127655 SIDELOBE(DB)=-42.36793
ENERGY: LEVEL(DB)= 28.23335 CENTER(MHZ)= 317.7496 WIDTH(MHZ)= 3.061516 SKEW(MHZ)= 4.432138E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.45	316.55438	316.55438	316.55438	0.00000	316.55438	0.00000	0.00	316.55438	316.55438
0.50	316.41470	319.07794	317.74634	2.66324	317.72159	2.64567	-13.33	316.41470	319.07794
1.00	316.38312	319.13919	317.76117	2.75607	317.72272	2.73111	-14.74	316.38312	319.13919
2.00	316.34183	319.20465	317.77325	2.86282	317.74283	2.83570	-17.62	316.34183	319.20465
3.00	316.31100	319.24332	317.77716	2.93231	317.74283	2.83570	-17.58	316.31100	319.24332
4.00	316.28369	319.27631	317.78000	2.99261	317.74387	2.88286	-20.06	316.28369	319.27631
5.00	316.26093	319.30380	317.78235	3.04288	317.75266	2.89922	-21.41	316.26093	319.30380
6.00	316.24118	319.32797	317.78458	3.08679	317.74545	2.91319	-23.07	316.24118	319.32797
10.00	316.17871	319.40173	317.79022	3.22302	317.75000	2.93531	-29.02	316.17871	319.40173
20.00	316.07715	319.51581	317.79648	3.43866	317.74963	2.94213	-40.67	316.07715	319.51581
30.00	316.01199	319.58505	317.79852	3.57306	317.74960	2.94252	-47.74	316.01193	319.58505
40.00	315.97440	319.61307	317.79373	3.63867	317.74960	2.94257	-50.86	315.97440	319.61307

BAND(MHZ) 316.575 318.825
LMIN(DB) -0.42
LMAX(DB) 0.32
LDEL(DB) 0.74
PMIN(DEG) -1259.74
PMAX(DEG) 1257.66
PDEL(DEG) 2517.41
File: 4AC8008A.DAT Passband Symmetry = 0.2 dB

FILE=4CC8B08A.DAT 10:27:23 06-16-1998
PN_100834_026 FINAL_FUNCTIONAL TEMP:C FLIGHT7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 326.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25
REFERENCES: LOSS(DB)= 27.96955 PHASE(DEG)=-2229.531 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1439439 PHASE(DEG)= 742.9979
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



PEAK: LEVEL(DB)= 27.54622 FREQ(MHZ)= 325.5599 DELAY(US)=-3.230177 SIDELOBE(DB)=-36.07056
ENERGY: LEVEL(DB)= 28.10933 CENTER(MHZ)= 326.7594 WIDTH(MHZ)= 3.066418 SKEW(MHZ)= .0228336

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.42	325.55988	325.55988	325.55988	0.00000	325.55988	0.00000	0.00	325.55988	325.55988
0.50	325.41058	328.12067	326.76563	2.71008	326.75964	2.70328	-13.07	325.41058	328.12067
1.00	325.38376	328.16000	326.77188	2.77625	326.75922	2.79335	-15.52	325.38376	328.16000
2.00	325.33841	328.21121	326.77481	2.87280	326.75946	2.86063	-17.55	325.33841	328.21121
3.00	325.30420	328.24707	326.77563	2.94287	326.75946	2.86063	-17.50	325.30420	328.24707
4.00	325.27539	328.27496	326.77518	2.99957	326.75983	2.90342	-20.05	325.27539	328.27496
5.00	325.25067	328.29846	326.77457	3.04779	326.75983	2.90342	-20.01	325.25067	328.29846
6.00	325.22925	328.31915	326.77420	3.08990	326.75992	2.94068	-23.19	325.22925	328.31915
10.00	325.16171	328.38333	326.77252	3.22162	326.75983	2.95785	-27.07	325.16171	328.38333
20.00	325.05615	328.48141	326.76880	3.42526	326.75946	2.96839	-37.97	325.05615	328.48141
30.00	324.99030	328.53943	326.76486	3.54913	326.75934	2.96915	-46.04	324.99030	328.53943
40.00	324.93655	328.80325	326.86990	3.86670	326.75937	2.96924	-50.23	324.93655	328.80325

BAND(MHZ) 325.575 327.825
LMIN(DB) -0.35
LMAX(DB) 0.21
LDEL(DB) 0.56
PMIN(DEG) -1251.35
PMAX(DEG) 1267.40
PDEL(DEG) 2518.75
File: 4CC8B08A.DAT Passband Symmetry = 0.0 dB

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-4 PHONON PART: 100826 SERIAL:008
TESTED BY: 210 TITLE: Test tech DATE: 6/15/98 TIME: 4:30pm
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL:3410A04374 CAL DUE:1/29/99
HP 3478A SERIAL:2136A03127 CAL DUE:7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	14.6	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 317.535/317.865 MHz	317.787	MHz	P
		HI: 326.535/326.865 MHz	326.783	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 2.8/3.0 MHz	2.932	MHz	P
		HI: 2.8/3.0 MHz	2.942	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.2	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		316.575-318.825 MHz: /1.0 dB	0.7	dB	P
		325.575-327.825 MHz: /1.0 dB	0.6	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.2	dB	P
		HI: 27.8/30.2 dB	28.2	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.0	dB	P
		HI: -0.4/0.4 dB	0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.0	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			

BAND	PEAK(dB)	WIDTH(MHz)	P/F
WIDE: 1-313,331-1000 MHz:	44.8	0.000	
DUAL: 313.000-315.585, 319.815-324.585, 328.815-331.0 MHz:	38.5	0.082	
PEAK: 35.0/ dB	38.5 dB		P
WIDTH: /0.6 MHz		0.082 MHz	P

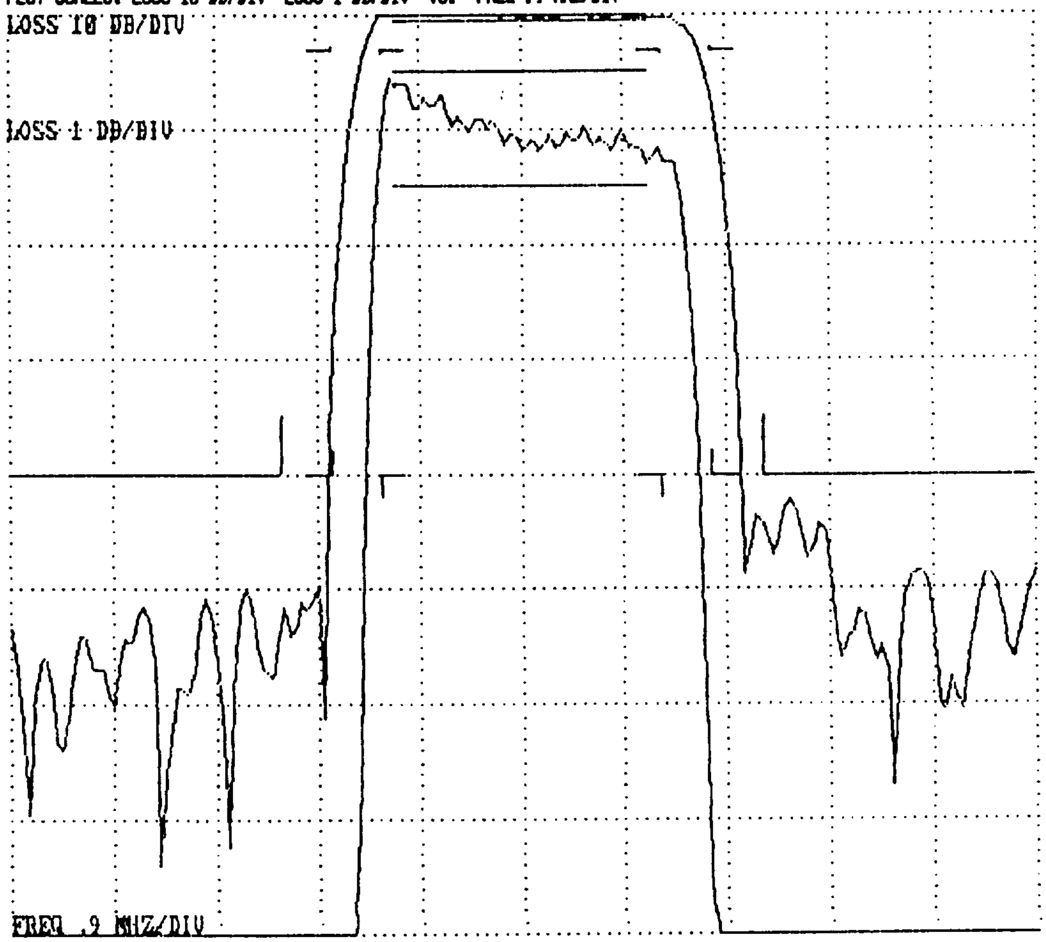
PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.24	Unitless	P
		HI: /1.30 Unitless	1.34	Unitless	F (P)
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		316.575-318.825,325.575-327.825 MHz			
		DUAL S11: 7.5/ dB	9.8	dB	P
		DUAL S22: 7.5/ dB	10.3	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.06/0.06 MHz	+0.001	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P (P)		

SEE EXPLANATION FOR WORST CASE AT +35C

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION
FILE=4AR8B08A.DAT 10:38:17 06-16-1998
PN_100834_826 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 317.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25
REFERENCES: LOSS(DB)= 28.20905 PHASE(DEG)= 4171.411 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1693581 PHASE(DEG)= 743.5002
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



PEAK: LEVEL(DB)= 27.75493 FREQ(MHZ)= 316.56 DELAY(US)=-3.134922 SIDELOBE(DB)=-42.74291
ENERGY: LEVEL(DB)= 28.38442 CENTER(MHZ)= 317.7592 WIDTH(MHZ)= 3.061107 SKEW(MHZ)= .0441462

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.45	316.56003	316.56003	316.56003	0.00000	316.56003	0.00000	0.00	316.56003	316.56003
0.50	316.42404	319.08603	317.75504	2.66199	317.72269	2.64358	-13.34	316.42404	319.08603
1.00	316.39169	319.14648	317.76910	2.75479	317.72479	2.72841	-14.74	316.39169	319.14648
2.00	316.35010	319.21219	317.78113	2.86209	317.76257	2.80148	-16.58	316.35010	319.21219
3.00	316.32117	319.25366	317.78741	2.93250	317.76035	2.85868	-18.77	316.32117	319.25366
4.00	316.29349	319.28571	317.78961	2.99222	317.74360	2.87905	-20.03	316.29349	319.28571
5.00	316.27078	319.31305	317.79193	3.04227	317.75906	2.89756	-21.51	316.27078	319.31305
6.00	316.25095	319.33731	317.79413	3.08636	317.75906	2.89756	-21.48	316.25095	319.33731
10.00	316.18887	319.41086	317.79987	3.22198	317.75873	2.93285	-29.14	316.18887	319.41086
20.00	316.08798	319.52515	317.80658	3.43716	317.75909	2.93948	-40.72	316.08798	319.52515
30.00	316.02075	319.59293	317.80682	3.57217	317.75916	2.93986	-47.64	316.02075	319.59293
40.00	315.99103	319.62424	317.80762	3.63321	317.75916	2.93931	-58.71	315.99103	319.62424

BAND(MHZ) 316.575 318.825
LMIN(DB) -0.39
LMAX(DB) 0.31
LDEL(DB) 0.70
PMIN(DEG) -1259.86
PMAX(DEG) 1257.62
PDEL(DEG) 2517.48
File: 4AR8B08A.DAT Passband Symmetry = 0.2 dB

PHONON CORPORATION

FILE=4CR8B08A.DAT 10:39:05 06-16-1998

PN_100834_026 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /N DUAL_SXX

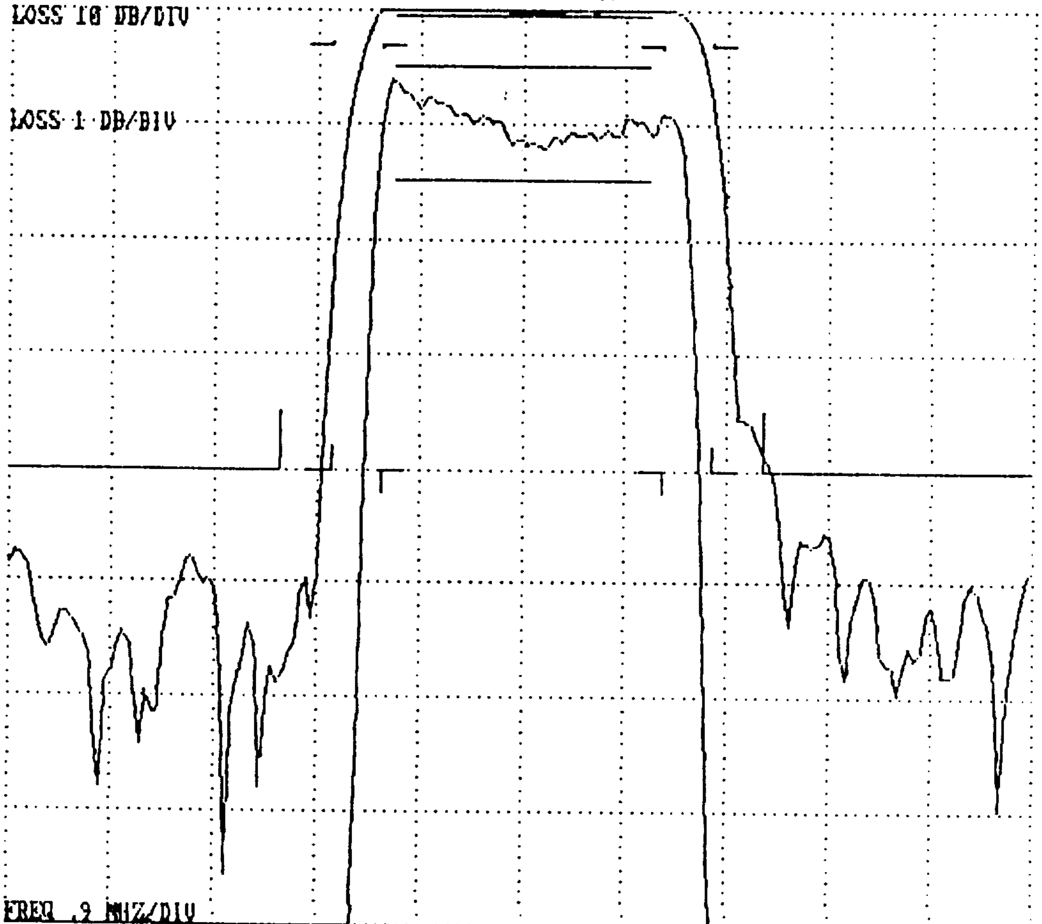
06-15-1998 HP8753,SSCF,SSFFIX,SSREF

FREQUENCY(MHZ): CENTER= 326.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25

REFERENCES: LOSS(DB)= 28.16384 PHASE(DEG)=-2887.575 DELAY(US)= 0 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= .1462384 PHASE(DEG)= 743.1583

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



PEAK: LEVEL(DB)= 27.74258 FREQ(MHZ)= 325.5691 DELAY(US)=-3.225389 SIDELOBE(DB)=-36.02836

ENERGY: LEVEL(DB)= 28.30926 CENTER(MHZ)= 326.766 WIDTH(MHZ)= 3.06602 SKEW(MHZ)= 2.415507E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.42	325.56912	325.56912	325.56912	0.00000	325.56912	0.00000	0.00	325.56912	325.56912
0.50	325.41888	328.12634	326.77261	2.70746	326.75922	2.70617	-13.09	325.41888	328.12634
1.00	325.39108	328.16660	326.77884	2.77551	326.75989	2.78973	-15.54	325.39108	328.16660
2.00	325.34674	328.21786	326.78229	2.87112	326.76144	2.85650	-17.55	325.34674	328.21786
3.00	325.31195	328.25385	326.78290	2.94189	326.77475	2.88227	-18.68	325.31195	328.25385
4.00	325.28339	328.28195	326.78265	2.99857	326.76315	2.90514	-20.04	325.28339	328.28195
5.00	325.25879	328.30560	326.78220	3.04681	326.77194	2.92188	-21.43	325.25879	328.30560
6.00	325.23740	328.32651	326.78195	3.08911	326.76447	2.93632	-23.17	325.23740	328.32651
10.00	325.16983	328.39117	326.78052	3.22134	326.76532	2.95350	-27.03	325.16983	328.39117
20.00	325.06381	328.49109	326.77747	3.42728	326.76590	2.96412	-37.00	325.06381	328.49109
30.00	324.99658	328.55508	326.77582	3.55850	326.76593	2.96495	-47.13	324.99658	328.55508
40.00	324.94373	328.88718	326.91547	3.94345	326.76596	2.96502	-51.27	324.94373	328.88718

BAND(MHZ) 325.575 327.825

LMIN(DB) -0.38

LMAX(DB) 0.21

LDEL(DB) 0.59

PMIN(DEG) -1251.23

PMAX(DEG) 1268.12

PDEL(DEG) 2519.35

File: 4CR8B08A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION

FILE=4ER8B08A.DAT 10:39:50 06-16-1998

PN_100834_026 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /N WIDE_S21

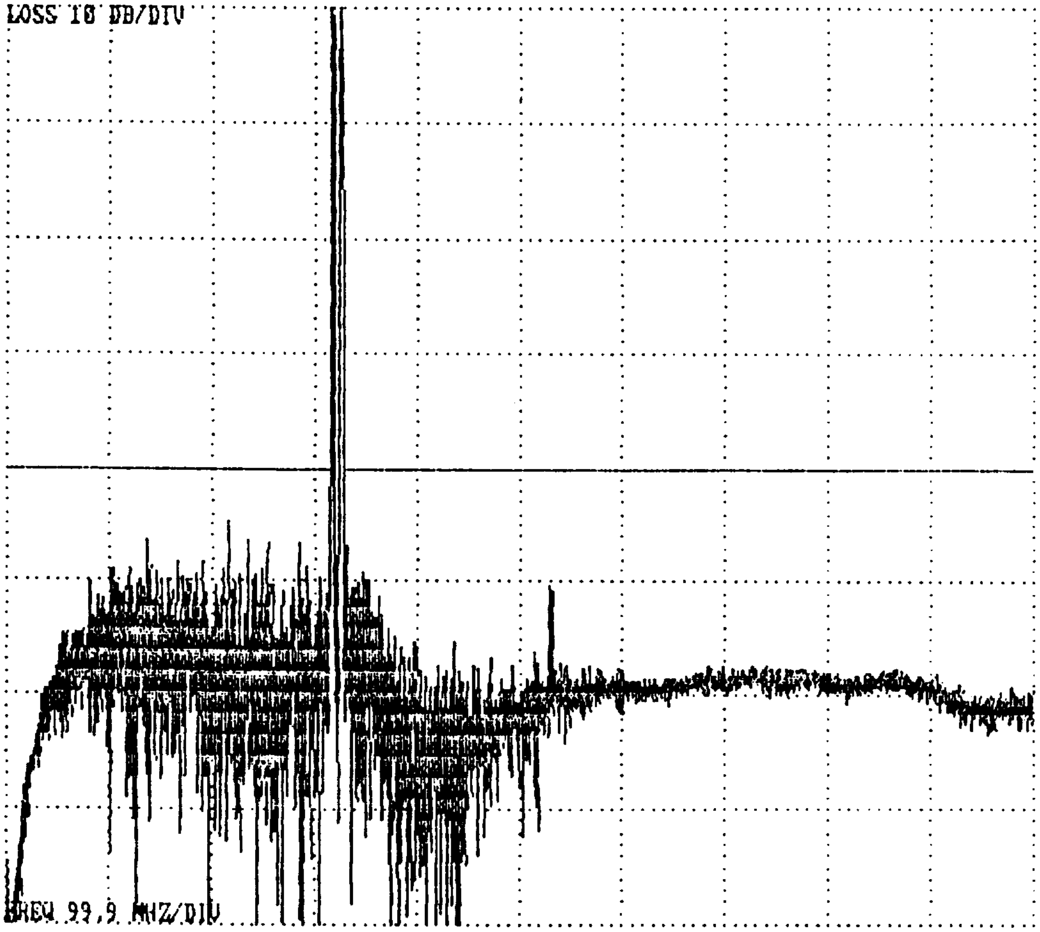
06-15-1998 HP8753,SSREF,SSREF

FREQUENCY(MHZ): CENTER= 500.5 WIDTH= 999 INCR.= .208125 SYSTEM BANDWIDTH= 999

REFERENCES: LOSS(DB)= 28.10644 PHASE(DEG)=-2274.074 DELAY(US)= 4.750938 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= 6.927536 PHASE(DEG)= 4334.432

PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV



PEAK: LEVEL(DB)= 27.40532 FREQ(MHZ)= 316.6178 DELAY(US)= 6.361495 SIDELOBE(DB)=-43.13812

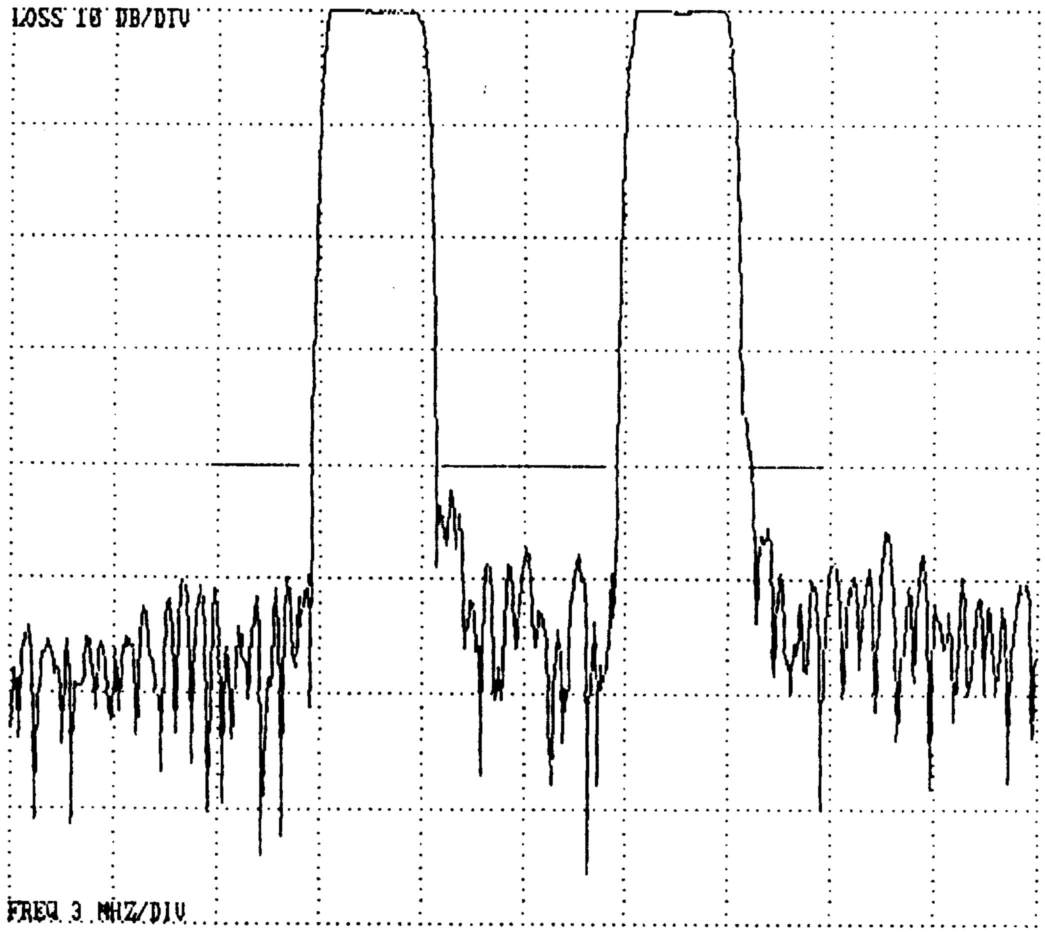
ENERGY: LEVEL(DB)= 28.34573 CENTER(MHZ)= 322.3288 WIDTH(MHZ)= 6.130546 SKEW(MHZ)= 198.9621

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.78	316.61780	316.61780	316.61780	0.00000	316.61780	0.00000	0.00	316.61780	316.61780
0.50	316.41989	319.08430	317.75238	2.66501	317.73471	2.69074	-24.91	316.61780	328.14093
1.00	316.38736	319.15790	317.77264	2.77054	317.73471	2.69074	-24.91	316.61780	328.16925
2.00	316.34641	319.21478	317.78058	2.86838	317.73471	2.69074	-24.91	316.61780	328.21533
3.00	316.31845	319.25513	317.78680	2.93668	317.80078	2.81577	-25.08	316.61780	328.25647
4.00	316.29614	319.29639	317.79626	3.00024	317.75192	2.91110	-25.21	316.29614	328.28806
5.00	316.27576	319.32907	317.80243	3.05331	317.75192	2.91110	-25.21	316.27576	328.31268
6.00	316.25687	319.35379	317.80533	3.09692	317.75192	2.91110	-25.21	316.25687	328.33279
10.00	316.19391	319.41602	317.80496	3.22211	317.75192	2.91110	-25.21	316.19391	328.38687
20.00	316.09052	319.48718	317.78885	3.39667	317.75888	2.92916	-25.24	316.09652	328.46725
30.00	316.02347	319.55228	317.78787	3.52881	317.75888	2.92916	-25.24	316.02347	328.54764
40.00	315.95642	319.61737	317.78690	3.66095	317.75888	2.92916	-25.24	315.95642	328.82086

BAND(MHZ)	1.000	313.000	331.000	1000.000
LMIN(DB)	44.80	-0.34	46.98	
LMAX(DB)	91.13	71.21	93.33	
LDEL(DB)	46.33	71.55	46.35	
PMIN(DEG)	-7135.23	-4334.55	-7910.10	
PMAX(DEG)	-2719.99	-550.77	3558.71	
PDEL(DEG)	4415.24	3783.77	11468.81	

FILE: 4ER8B08A.DAT Out-of-band Rejection: PEAK= 44.8 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE=4FR8B08A.DAT 10:40:09 06-16-1998
PN_100834_026 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 322.2 WIDTH= 30 INCR.= .05 SYSTEM BANDWIDTH= 30
REFERENCES: LOSS(DB)= 28.18644 PHASE(DEG)= 476.7845 DELAY(US)= 1.797302 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 23.06957 PHASE(DEG)= 853.7922
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 3 MHZ/DIV



PEAK: LEVEL(DB)= 27.7426 FREQ(MHZ)= 325.5691 DELAY(US)= .3692106 SIDELOBE(DB)=-36.02895
ENERGY: LEVEL(DB)= 28.34636 CENTER(MHZ)= 322.3052 WIDTH(MHZ)= 6.12676 SKEW(MHZ)=-7.792184E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.44	325.56909	325.56909	325.56909	0.00000	325.56909	0.00000	0.00	325.56909	325.56909
0.50	325.41733	328.12842	326.77289	2.71109	326.75922	2.72029	-9.34	316.42596	328.12842
1.00	325.39005	328.16803	326.77905	2.77798	326.75909	2.80429	-9.44	316.39285	328.16803
2.00	325.34586	328.21881	326.78235	2.87296	326.76144	2.87140	-9.52	316.35086	328.21881
3.00	325.31125	328.25455	326.78290	2.94330	326.77475	2.89731	-9.55	316.32181	328.25455
4.00	325.28281	328.28253	326.78265	2.99973	326.76315	2.92029	-9.57	316.29401	328.28253
5.00	325.25827	328.30609	326.78217	3.04782	326.77194	2.93713	-9.59	316.27127	328.30609
6.00	325.23691	328.32693	326.78192	3.09003	326.76447	2.95164	-9.60	316.25137	328.32693
10.00	325.16953	328.39148	326.78052	3.22195	326.76532	2.96891	-9.61	316.18918	328.39148
20.00	325.06363	328.49124	326.77744	3.42761	326.76590	2.97959	-9.59	316.08817	328.49124
30.00	324.99646	328.55527	326.77588	3.55881	326.76590	2.98042	-9.57	316.02087	328.55527
40.00	324.94360	328.88785	326.91571	3.94424	326.76596	2.98049	-9.51	315.99106	328.88785

BAND(MHZ)	316.575	318.825	325.575	327.825
LMIN(DB)	-0.37	-0.43	-0.40	
LMAX(DB)	0.33	75.51	0.19	
LDEL(DB)	0.70	75.93	0.59	
PMIN(DEG)	234.87	-855.06	-992.23	
PMAX(DEG)	1328.88	571.15	103.66	
PDEL(DEG)	1094.01	1426.21	1095.88	

FILE: 4FR8B08A.DAT Out-of-band Rejection: PEAK= 38.5 dB WIDTH= 0.082 MHz

PHONON CORPORATION
FILE: 4FR8B08A.DAT (+SSCF)
PN_100834_026 FINAL_FUNCTIONAL TEMP:R FLIGHT7_3FUNCT /N DUAL_SXX
06-15-1998 HP8753,SSREF,SSREF,SSCF
REFERENCES: LOSS(DB)= 28.18644 PHASE(DEG)= 476.7845
DELAY(US)= 1.797302 SLOPE(US/MHZ)= 0

BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY(MHZ)	LOSS(DB)	PHASE(DEG)
315.000	56.47	1256.74
315.720	52.35	1482.68
316.440	0.35	1405.03
317.160	-0.08	1052.00
317.880	0.19	693.36
318.600	0.06	334.01
319.320	5.30	-15.37
320.040	42.31	-402.39
320.760	54.77	-758.00
321.480	58.47	-637.45
322.200	48.49	-476.79
322.920	50.87	-123.90
323.640	51.52	436.01
324.360	57.63	453.02
325.080	18.07	367.05
325.800	-0.16	-1.13
326.520	0.00	-362.70
327.240	0.08	-719.28
327.960	-0.12	-1066.67
328.680	35.74	-1249.08
329.400	45.79	-1607.32

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-4 PHONON PART: 100826 SERIAL: 008

TESTED BY: 210 TITLE: Test tech DATE: 6/15/98 TIME: 4:30pm

TEST: FINAL FUNCTIONAL

EQUIPMENT: HP 8753D SERIAL: 3410A04374 CAL DUE: 1/29/99

HP 3478A SERIAL: 2136A03127 CAL DUE: 7/7/98

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	35.0	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 317.535/317.865 MHz	317.788	MHz	P
		HI: 326.535/326.865 MHz	326.781	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 2.8/3.0 MHz	2.932	MHz	P
		HI: 2.8/3.0 MHz	2.939	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.2	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		316.575-318.825 MHz: /1.0 dB	0.6	dB	P
		325.575-327.825 MHz: /1.0 dB	0.6	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.4	dB	P
		HI: 27.8/30.2 dB	28.3	dB	P
1.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.2	dB	P
		HI: -0.4/0.4 dB	0.2	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.0	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			

BAND	PEAK(dB)	WIDTH(MHz)	P/F
WIDE: 1-313,331-1000 MHz:	45.0	0.000	
DUAL: 313.000-315.585, 319.815-324.585, 328.815-331.0 MHz:	39.2	0.100	
PEAK: 35.0/ dB	39.2 dB		P
WIDTH: /0.6 MHz		0.100 MHz	P

PARAGRAPH REQ.	Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.24	Unitless	P
		HI: /1.30 Unitless	1.35	Unitless	F (P)
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		316.575-318.825,325.575-327.825 MHz			
		DUAL S11: 7.5/ dB	9.6	dB	P
		DUAL S22: 7.5/ dB	10.3	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.06/0.06 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P (DP)		

PER AE-24937E
ECN CAMSU-1550
SF|35dB ≤ 1.30
SF|40dB ≤ 1.35
ACTUAL DATA:
SF|35dB = 1.231 (P)
SF|40dB = 1.346 (P)
SEE PLOT ON PROCEEDING PAGE
(DP)

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION

FILE=4AH8B08A.DAT 10:49:53 06-16-1998

PN_100834_826 FINAL_FUNCTIONAL TEMP:H FLIGHT7_3FUNCT /N DUAL_SXX

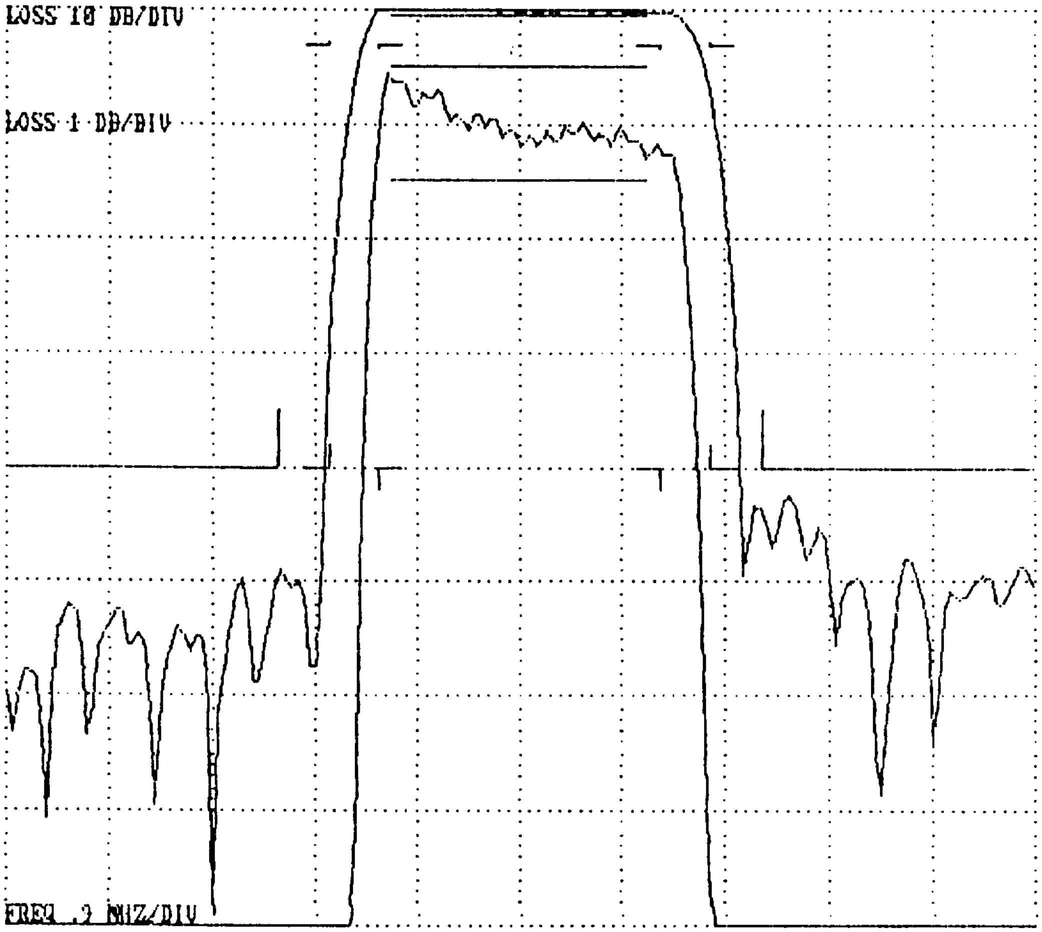
06-15-1998 HP8753,SSCF,SSFFIX,SSREF

FREQUENCY(MHZ): CENTER= 317.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25

REFERENCES: LOSS(DB)= 28.36022 PHASE(DEG)= 4573.936 DELAY(US)= 0 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= .1659305 PHASE(DEG)= 743.55

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



PEAK: LEVEL(DB)= 27.90581 FREQ(MHZ)= 316.5611 DELAY(US)=-3.135683 SIDELOBE(DB)=-42.82364

ENERGY: LEVEL(DB)= 28.53499 CENTER(MHZ)= 317.7606 WIDTH(MHZ)= 3.060536 SKEW(MHZ)= 4.287735E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.45	316.56110	316.56110	316.56110	0.00000	316.56110	0.00000	0.00	316.56110	316.56110
0.50	316.42484	319.08853	317.75668	2.66370	317.72357	2.64398	-13.34	316.42484	319.08853
1.00	316.39273	319.14713	317.76993	2.75439	317.72580	2.72880	-14.75	316.39273	319.14713
2.00	316.35114	319.21246	317.78180	2.86133	317.76358	2.80198	-16.52	316.35114	319.21246
3.00	316.32227	319.25406	317.78815	2.93179	317.76147	2.85902	-18.79	316.32227	319.25406
4.00	316.29456	319.28592	317.79022	2.99136	317.75085	2.87938	-20.05	316.29456	319.28592
5.00	316.27185	319.31317	317.79251	3.04132	317.76031	2.89771	-21.54	316.27185	319.31317
6.00	316.25198	319.33737	317.79468	3.08539	317.76031	2.89771	-21.51	316.25198	319.33737
10.00	316.18985	319.41083	317.80035	3.22098	317.76007	2.93274	-29.16	316.18985	319.41083
20.00	316.08807	319.52512	317.80658	3.43704	317.76047	2.93933	-40.63	316.08807	319.52512
30.00	316.02148	319.59293	317.80719	3.57144	317.76053	2.93972	-47.40	316.02148	319.59293
40.00	315.98260	319.62347	317.80304	3.64087	317.76056	2.93977	-50.48	315.98260	319.62347

BAND(MHZ) 316.575 318.825

LMIN(DB) -0.37

LMAX(DB) 0.30

LDEL(DB) 0.68

PMIN(DEG) -1259.86

PMAX(DEG) 1257.87

PDEL(DEG) 2517.72

File: 4AH8B08A.DAT Passband Symmetry = 0.2 dB

PHONON CORPORATION

FILE=4CH8B08A.DAT 10:50:34 06-16-1998

PN_100834_026 FINAL_FUNCTIONAL TEMP:H FLIGHT7_3FUNCT /N DUAL_SXX

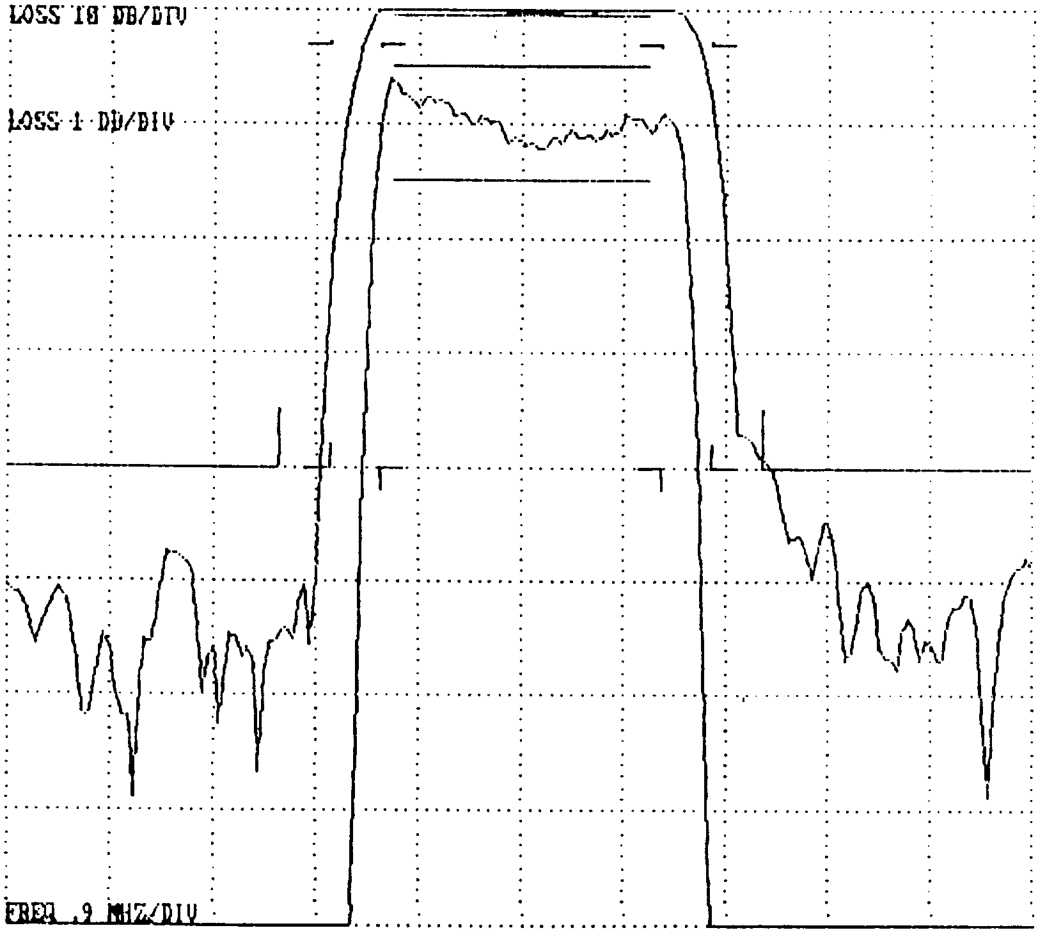
06-15-1998 HP8753,SSCF,SSFFIX,SSREF

FREQUENCY(MHZ): CENTER= 326.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25

REFERENCES: LOSS(DB)= 28.33474 PHASE(DEG)=-2485.988 DELAY(US)= 0 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= .145641 PHASE(DEG)= 743.2271

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



PEAK: LEVEL(DB)= 27.92376 FREQ(MHZ)= 325.5679 DELAY(US)=-3.228122 SIDELOBE(DB)=-45.2266

ENERGY: LEVEL(DB)= 28.48287 CENTER(MHZ)= 326.7639 WIDTH(MHZ)= 3.063662 SKEW(MHZ)= 2.403268E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.40	325.56787	325.56787	325.56787	0.00000	325.56787	0.00000	0.00	325.56787	325.56787
0.50	325.41879	328.12161	326.77020	2.70282	326.75912	2.70463	-13.94	325.41879	328.12161
1.00	325.39075	328.16196	326.77637	2.77121	326.75949	2.78763	-15.59	325.39075	328.16196
2.00	325.34589	328.21365	326.77979	2.86777	326.76059	2.85381	-17.61	325.34589	328.21365
3.00	325.31107	328.25043	326.78076	2.93936	326.77362	2.87895	-18.72	325.31107	328.25043
4.00	325.28250	328.27866	326.78058	2.99615	326.76190	2.90198	-20.12	325.28250	328.27866
5.00	325.25790	328.30237	326.78015	3.04446	326.77045	2.91818	-21.48	325.25790	328.30237
6.00	325.23648	328.32327	326.77988	3.08679	326.76291	2.93275	-23.26	325.23648	328.32327
10.00	325.16879	328.38806	326.77844	3.21927	326.76349	2.94964	-27.13	325.16879	328.38806
20.00	325.06277	328.48810	326.77545	3.42532	326.76382	2.96003	-37.98	325.06277	328.48810
30.00	324.99585	328.55103	326.77344	3.55518	326.76382	2.96003	-47.45	324.99585	328.55103
40.00	324.94370	328.89954	326.92163	3.95584	326.76385	2.96008	-58.65	324.94370	328.89954

BAND(MHZ) 325.575 327.825

LMIN(DB) -0.36

LMAX(DB) 0.22

LDEL(DB) 0.58

PMIN(DEG) -1250.91

PMAX(DEG) 1268.45

PDEL(DEG) 2519.36

File: 4CH8B08A.DAT Passband Symmetry = 0.1 dB

Report No. 11491
June 1999

Channel 15 Bandpass Filter

IF Filter (S/N: 1331559-1, S/N: 227-006)

APPENDIX A **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL1000-1000-10SS1 S/N P227-006
AEROJET 1331559-1 REV. E

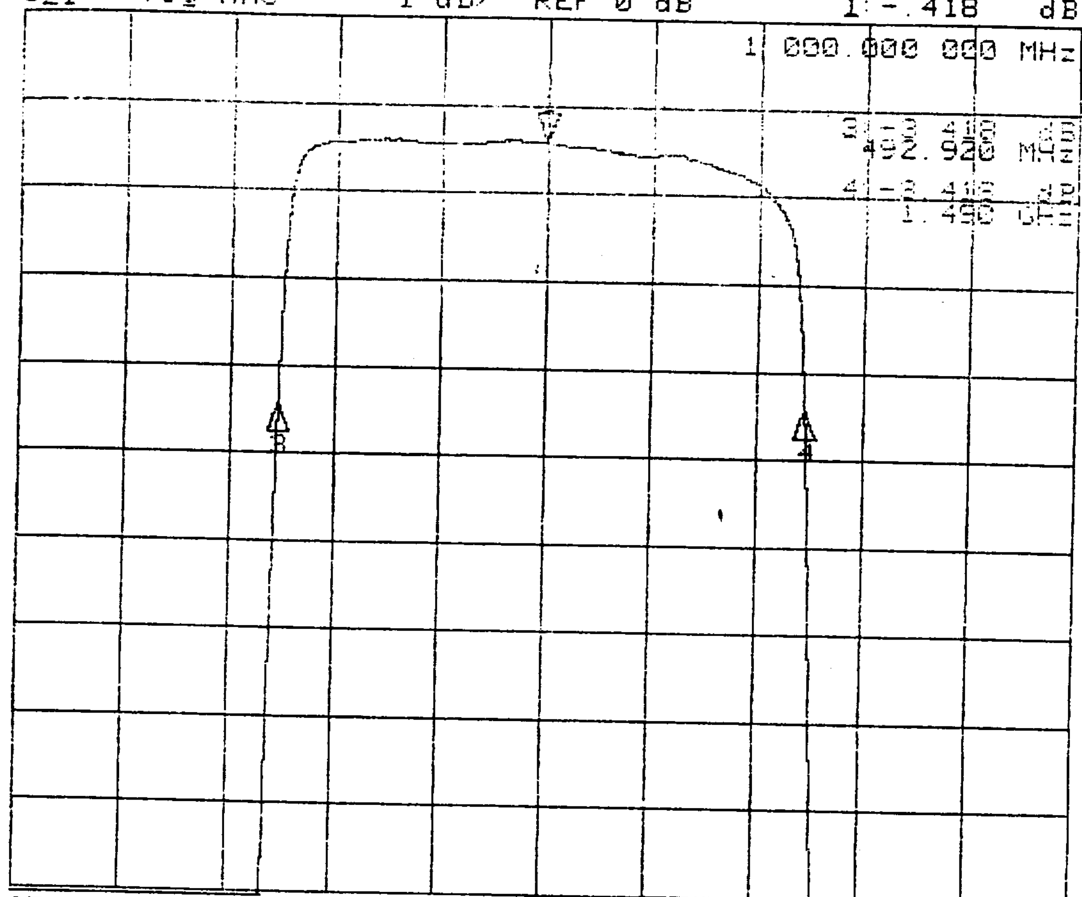
3.0 dB BANDWIDTH
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.5.3

	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	1490.41 MHz (1480.0-1500.0)	1488.98 Mhz (1480.0-1500.0)	1487.51 MHz (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	492.92 MHz (480.0-500.0)	492.08 Mhz (480.0-500.0)	490.78 MHz (480.0-500.0)
{9} 3.0 dB RELATIVE BANDWIDTH	997.49 MHz (980.0-1020.0)	996.90 MHz (980.0-1020.0)	996.73 MHz (980.0-1020.0)
{10} ADD {7} AND {8} ÷ 2 =	991.67 MHz (1000.0 NOM)	990.53 MHz (1000.0 NOM)	989.15 Mhz (1000.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.5 °C (-15.0 TO -10.0)	+16.0 °C (12.5 TO 17.5)	+41.7 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

PASSBAND RIPPLE
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.5.4

	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	940.02 MHz	695.09 Mhz	940.02 MHz
MIN INSERTION LOSS PERFORMANCE	-0.38 dB	-0.42 dB	-0.43 dB
{11b} 75% BW LOWER BANDEDGE FREQ	535.80 MHz	532.87 Mhz	531.09 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.60 dB	-0.66 dB	-0.70 dB
{11c} 75% BW UPPER BANDEDGE FREQ	1285.80 MHz	1282.87 Mhz	1281.09 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.60 dB	-0.66 dB	-0.70 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.22 dB	0.24 dB	0.27 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.22 dB	0.24 dB	0.27 dB

CH2 S_{21} log MAG 1 dB/ REF 0 dB 1: -.418 dB



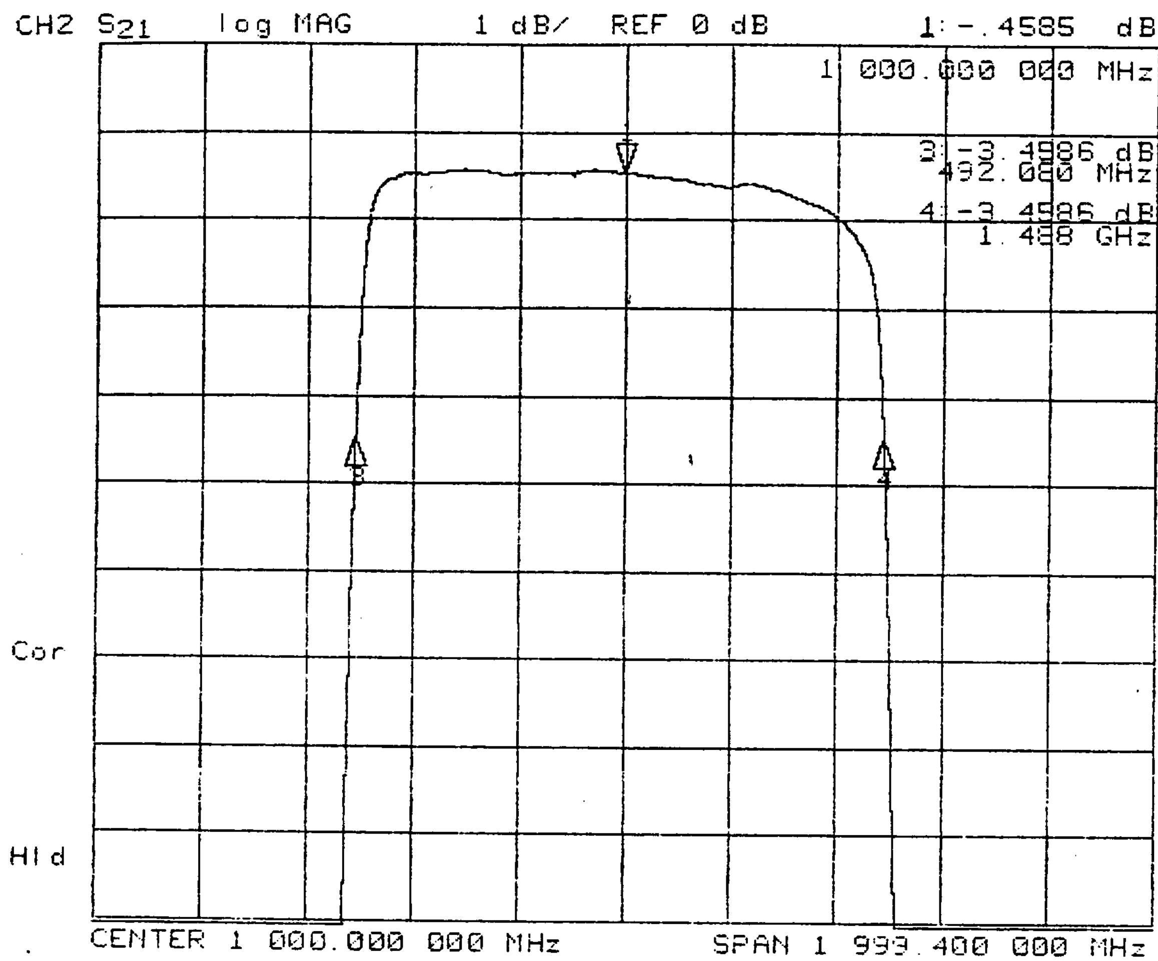
Cor

Hld

CENTER 1 000.000 000 MHz SPAN 1 999.400 000 MHz

FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P227-006
-10C DATA
OPR: R. HOGGATT DATE FEB 04 1997

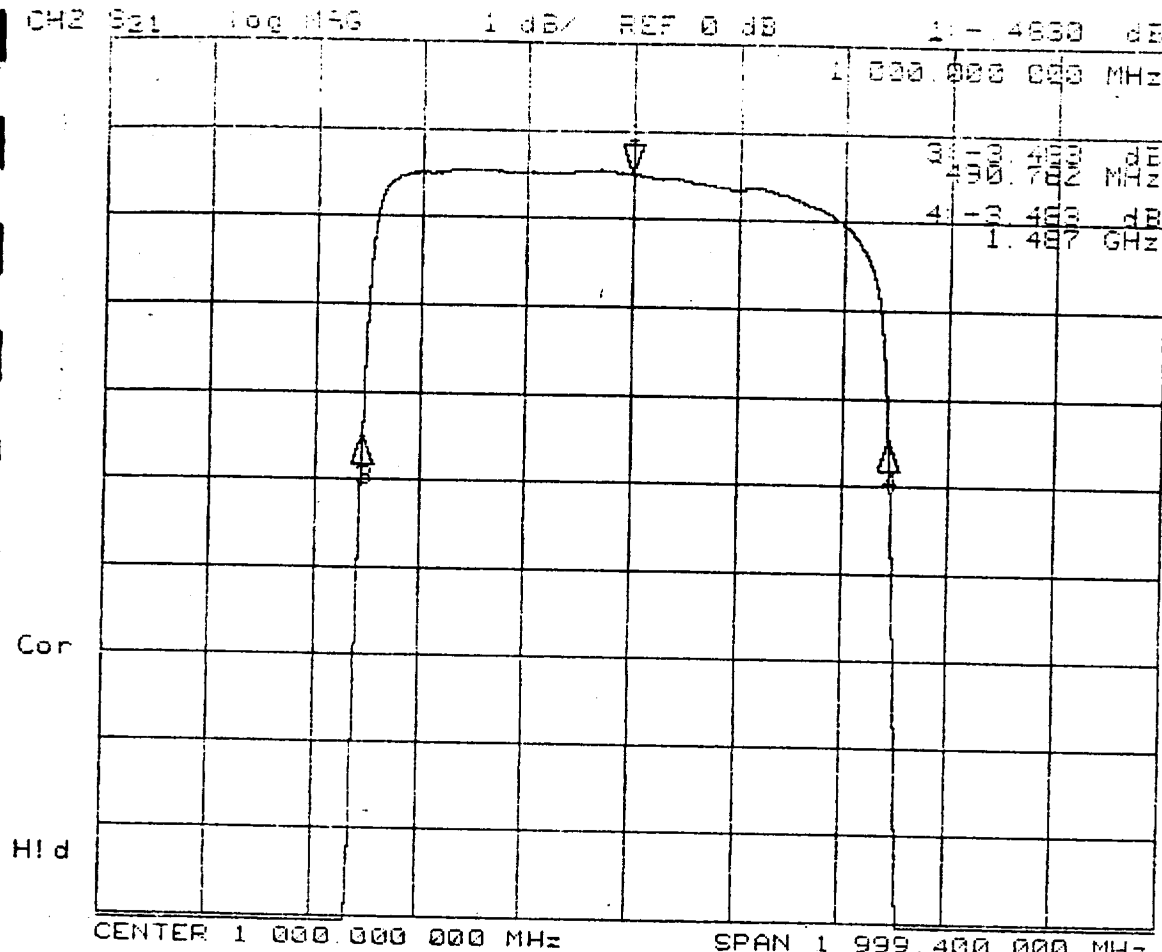
MARKER PARAMET		annel 2
MARKER 1	550.000000 MHz OFF	1000.000000 MHz -.418 dB
MARKER 2	1450.000000 MHz OFF	991.666303 MHz OFF
MARKER 3	625.000000 MHz OFF	492.920566 MHz -3.418 dB
MARKER 4	1375.000000 MHz OFF	1490.412040 MHz -3.418 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P227-006
+15C DATA
OPR: R. HOGGATT DATE FEB 04 1997 annel 2

MARKER PARAMET

MARKER 1	550.000000 MHz OFF	1000.000000 MHz -.4585 dB
MARKER 2	1450.000000 MHz OFF	990.530655 MHz OFF
MARKER 3	625.000000 MHz OFF	492.080780 MHz -3.4586 dB
MARKER 4	1375.000000 MHz OFF	1488.980531 MHz -3.4586 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P227-006
+40C DATA
OPR: R. HOGGATT DATE FEB 04 1997

MARKER PARAMET		annel 2
MARKER 1	550.000000 MHz OFF	1000.000000 MHz -.4830 dB
MARKER 2	1450.000000 MHz OFF	989.147792 MHz OFF
MARKER 3	625.000000 MHz OFF	490.782359 MHz -3.483 dB
MARKER 4	1375.000000 MHz OFF	1487.513225 MHz -3.483 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF

APPENDIX A **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL1000-1000-10SS1 S/N P227-006
AEROJET 1331559-1 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	PASS/FAIL	PASS/FAIL	PASS/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=1000.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 350.0 MHz	-65.5 dB (40.0 dB MIN)	-65.8 dB (40.0 dB MIN)	-66.0 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 1650.0 MHz TO 3000.0 MHz	-60.2 dB (40.0 dB MIN)	-60.6 dB (40.0 dB MIN)	-60.8 dB (40.0 dB MIN)
{13b} WORST CASE REJECTION FROM 3000.0 MHz TO 8000.0 MHz	-50.4 dB (40.0 dB MIN)	-50.7 dB (40.0 dB MIN)	-51.2 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-12.5 °C (-15.0 TO -10.0)	+16.0 °C (12.5 TO 17.5)	+41.7 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

TEST PERFORMED BY R. Hossain DATE 2/4/97 QA 5

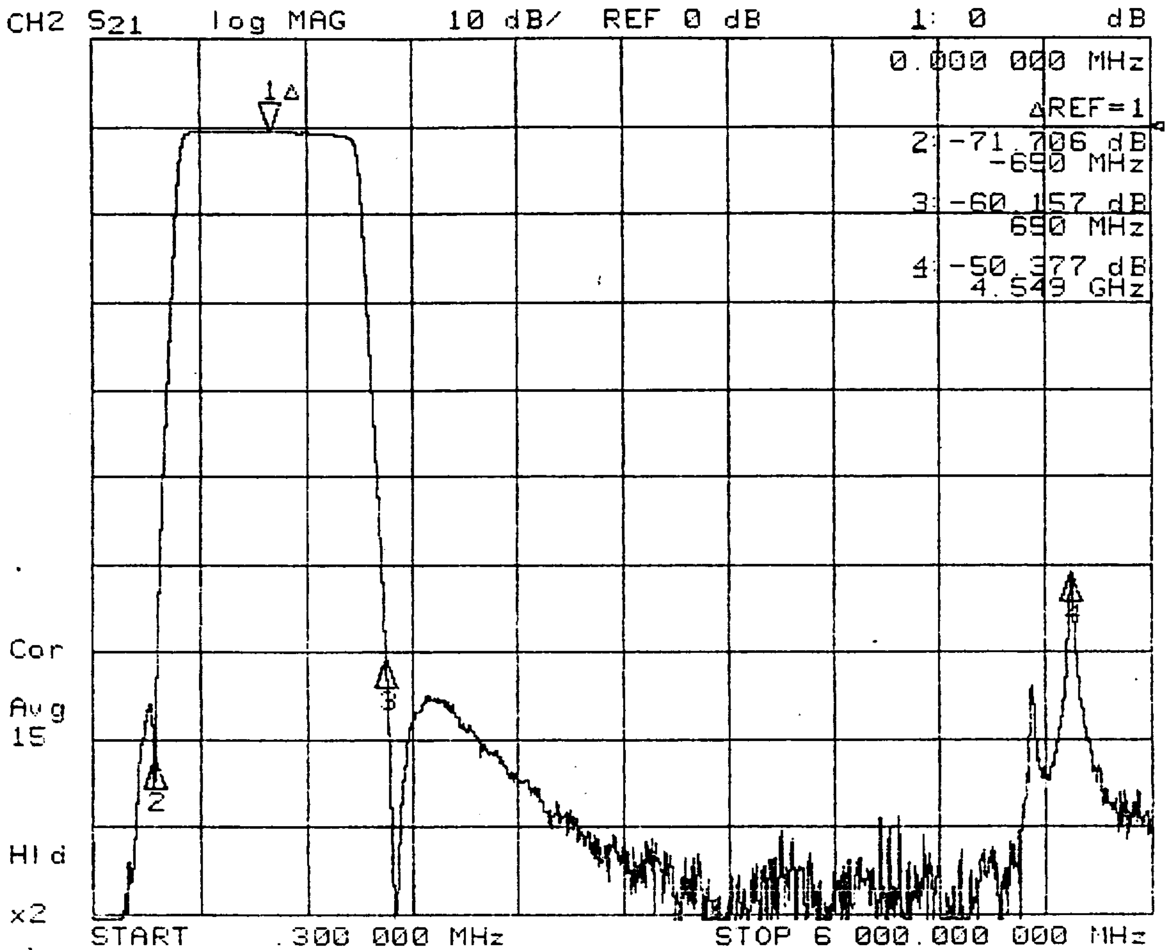
NOTE IF TEST WITNESSED BY AESD: ________ GSI: ____ Not Witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

{16} REFERENCE CUSTOMER DRAWING 1331559

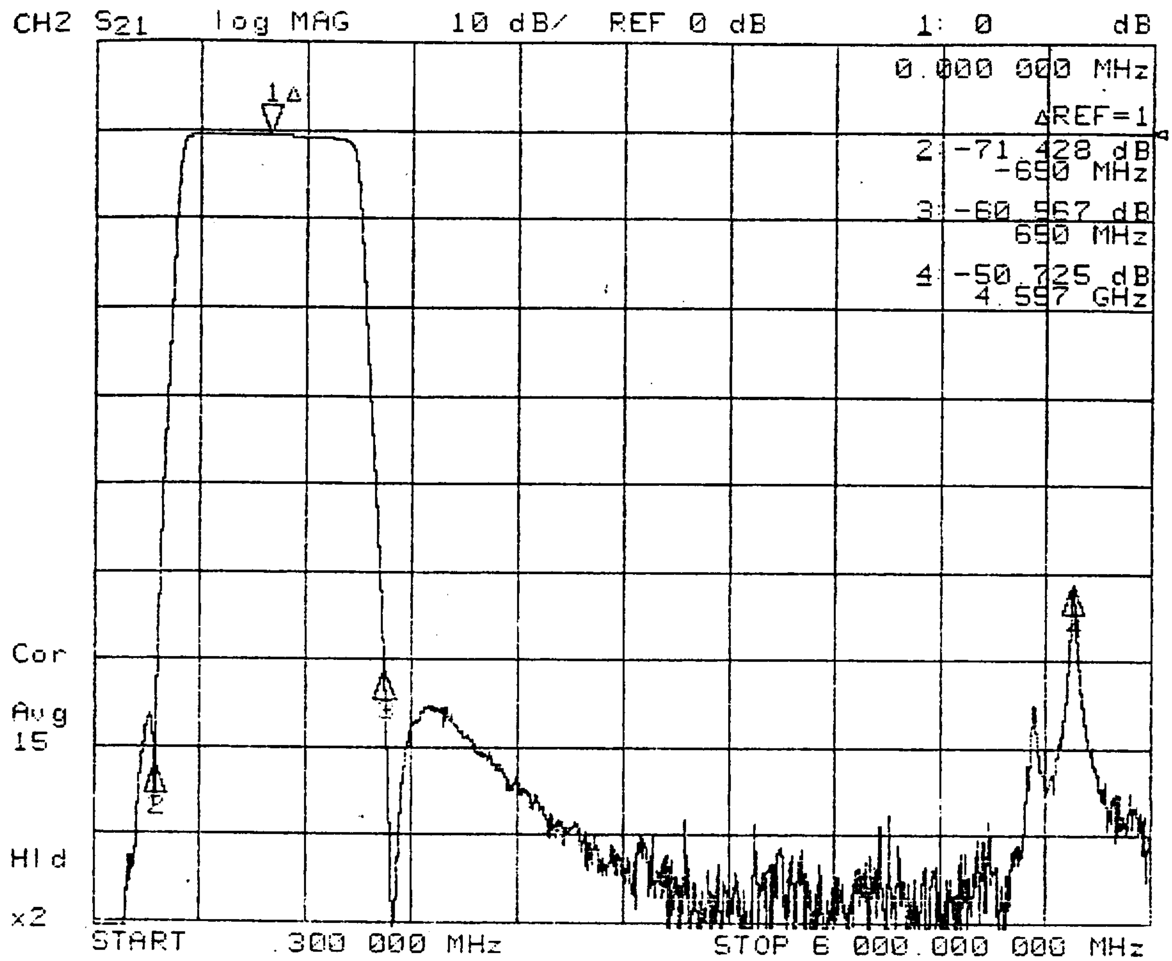
DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.500
MOUNTING HOLE CENTER	0.125 ± .010	.125
BETWEEN UPPER MOUNTING HOLES	3.250	3.248
BETWEEN LOWER MOUNTING HOLES	3.250	3.249



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P227-006
-10C DATA

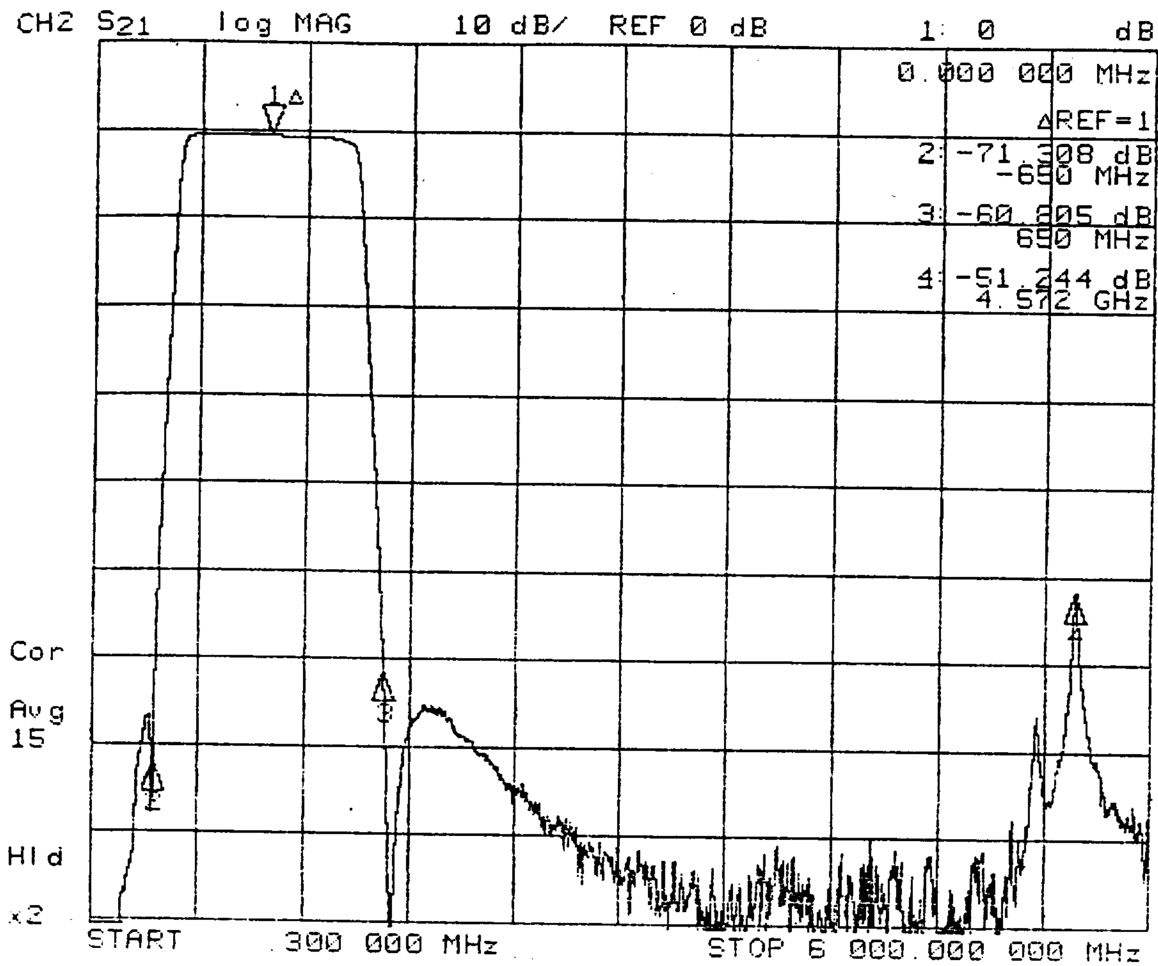
MARKER PARAMET! **OPR: R. HOGGATT DATE** FEB 04 1997 innel 2

MARKER 1	1000.000000 MHz OFF	1000.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	350.000000 MHz -71.706 dB
MARKER 3	1000.000000 MHz OFF	1650.000000 MHz -60.157 dB
MARKER 4	1000.000000 MHz OFF	5549.957067 MHz -50.377 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P227-006
+15C DATA
OPR: R. HOGGATT DATE FEB 04 1997

MARKER PARAMET		annel 2
MARKER 1	1000.000000 MHz OFF	1000.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	350.000000 MHz -71.428 dB
MARKER 3	1000.000000 MHz OFF	1650.000000 MHz -60.567 dB
MARKER 4	1000.000000 MHz OFF	5557.756706 MHz -50.725 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P227-006
+40C DATA
OPR: R. HOGGATT DATE FEB 04 1997

MARKER PARAMET ... annel 2

MARKER 1	1000.000000 MHz OFF	1000.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	350.000000 MHz -71.308 dB
MARKER 3	1000.000000 MHz OFF	1650.000000 MHz -60.805 dB
MARKER 4	1000.000000 MHz OFF	5572.755973 MHz -51.244 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF

APPENDIX A ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL1000-1000-10SS1 S/N P227-006
AEROJET 1331559-1 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.0 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	1.0	MHz	-80.6 dB	F11	1000.0	MHz	-0.53 dB
F2	10.0	MHz	-88.2 dB	F12	(*) 1100.0	MHz	-0.60 dB
F3	100.0	MHz	-92.2 dB	F13	(*) 1200.0	MHz	-0.67 dB
F4	300.0	MHz	-68.1 dB	F14	1300.0	MHz	-0.78 dB
F5	400.0	MHz	-37.0 dB	F15	1400.0	MHz	-1.06 dB
F6	500.0	MHz	-2.28 dB	F16	1500.0	MHz	-5.92 dB
F7	600.0	MHz	-0.54 dB	F17	1600.0	MHz	-40.7 dB
F8	700.0	MHz	-0.50 dB	F18	1700.0	MHz	-84.2 dB
F9	(*) 800.0	MHz	-0.53 dB	F19	2000.0	MHz	-66.6 dB
F10	(*) 900.0	MHz	-0.52 dB	F20	5000.0	MHz	-87.6 dB

TEST PERFORMED BY: R. Leggatt DATE 2/4/97 QA 5

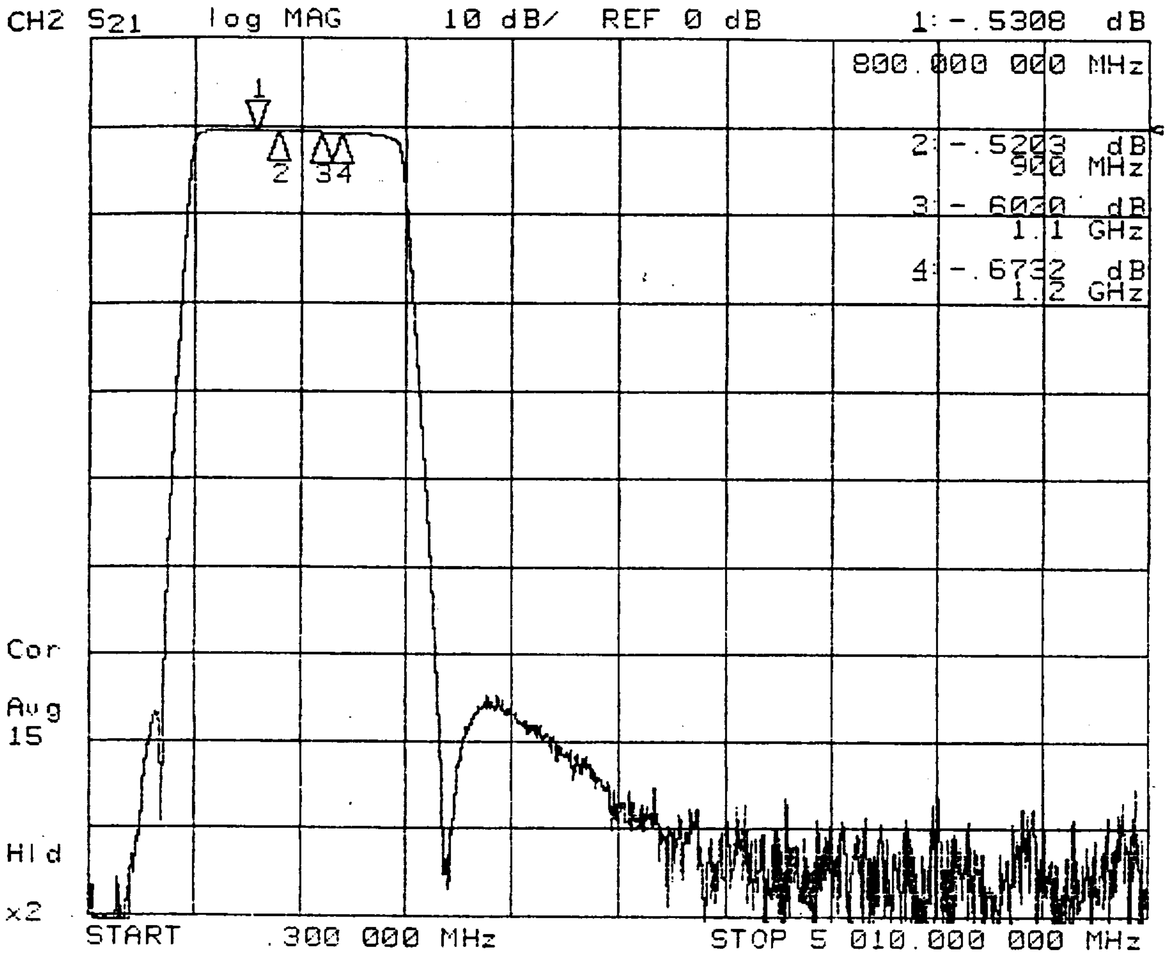
NOTE IF TEST WITNESSED BY AESD________ GSI _______ Not Witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX A PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P227-006
AMBIENT

MARKER PARAMET	OPR: R. HOGGATT DATE FEB 04 1997	annel 2
MARKER 1	1000.000000 MHz OFF	800.000000 MHz -.5308 dB
MARKER 2	1000.000000 MHz OFF	900.000000 MHz -.5203 dB
MARKER 3	1000.000000 MHz OFF	1100.000000 MHz -.6020 dB
MARKER 4	1000.000000 MHz OFF	1200.000000 MHz -.6732 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF

Report No. 11491
June 1999

GAIN STABILITY AND GAIN COMPRESSION

FOR

MIXER/AMPLIFIERS AND IF AMPLIFIERS

GAIN-TEMPERATURE SENSITIVITY FOR MIXER/AMPLIFIERS AND IF AMPLIFIERS

Channel No.	3	4	5	6	7	8	9	10	11	12	13	14	15
Specification (+/-dB/°C)	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.04	0.06	0.06	0.06	0.06	0.02
Measured (dB/°C)	-0.015	-0.017	-0.015	-0.017	-0.015	-0.017	-0.020 +0.005	-0.020 +0.005	-0.020 +0.005 -0.005 -0.014	-0.020 +0.005 -0.005 -0.010	-0.020 +0.005 -0.005 +0.010 -0.005	-0.020 +0.005 -0.005 -0.020	-0.017
Total (dB/°C)	-0.015	-0.017	-0.015	-0.017	-0.015	-0.017	+0.005, -0.020	+0.005, -0.020	+0.005, -0.039	+0.005, -0.035	+0.015, -0.030	+0.005, -0.045	-0.017

Report No. 11491
June 1999

Channel 3 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-13, S/N: 7A23)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.30	0.50	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	71.05	1.875	2.0	QA 1	
10.00	71.12				
10.04	71.20				
ΔGv =	0.15 dB				

		DATE	ACC	REJ
PART NO. 1331562-136	SPACEK QA	6-29-98	QA 1	

SER NO. 7A23 TEST FAILURE: ______

TESTED BY: 77V FAILURE ANALYSIS NO. ______

END DATE: 6-5-98

END TIME: 1600

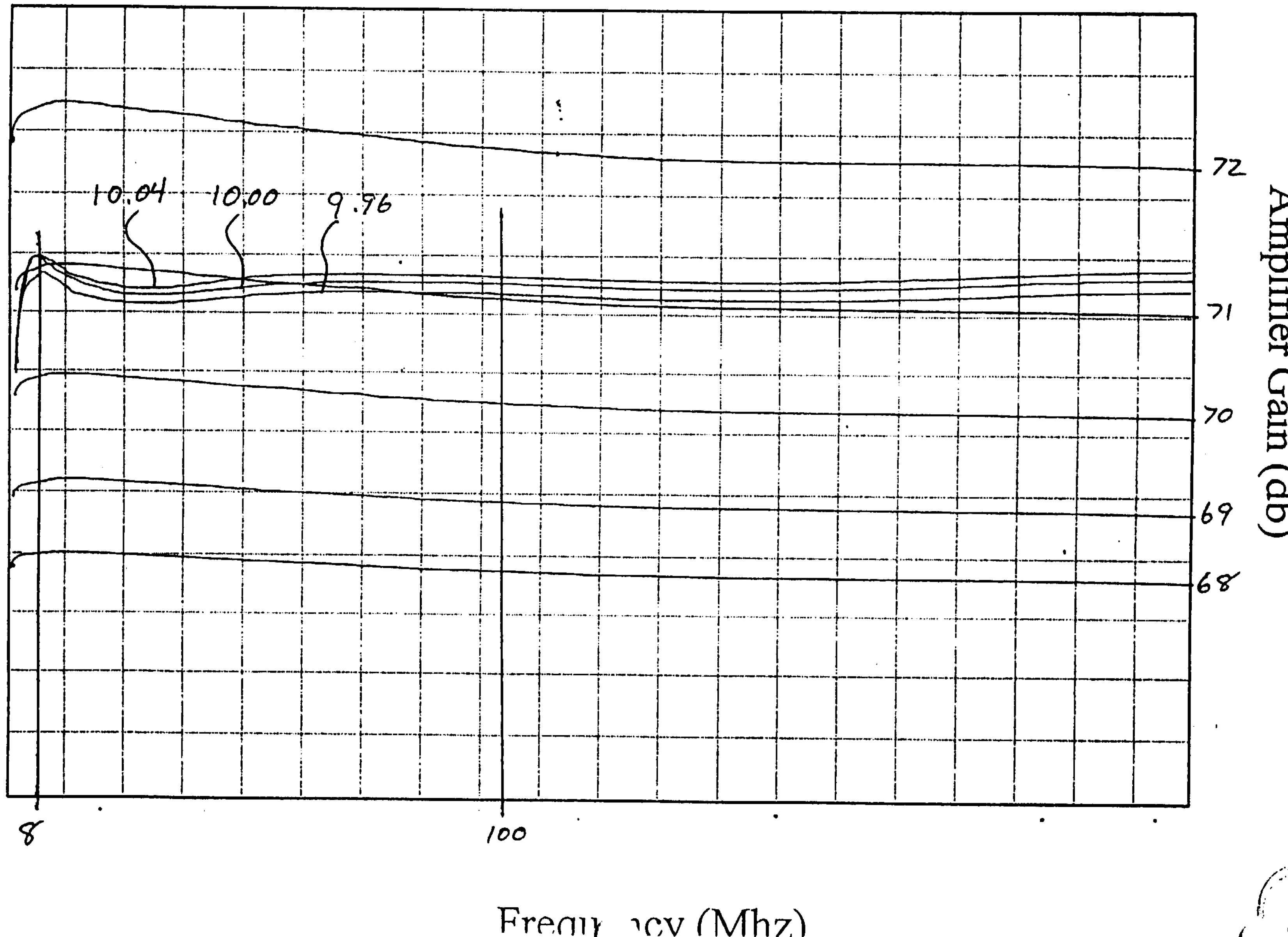
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No.	1331562-13
Serial No.	7A23
Date	6-5-98
Tested By	77[illegible]

Amb Temp +23°C



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TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 -6	GT1 71.62				
		* 0.012	0.035dB/°C	QA 1	
T2 +8	GT2 71.45				
		* 0.023	0.020dB/°C	QA 1	
T3 +28	GT3 71.00				
		* 0.023	0.035dB/°C	QA 1	
T4 +40	GT4 70.72				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \qquad i = 1,2,3,4 \qquad \Delta G_T = \underline{0.90}\text{ dB}$$

ECN
CAMSU-1352

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 1.45 dB Spec 1.4dB ACC____ REJ QA 1

DATE ACC ~~REJ~~

PART NO. 1331562-13-E SPACEK QA 6-29-98 QA 1

SER NO. 7A23 TEST FAILURE: ________

TESTED BY: 777 FAILURE ANALYSIS NO. ________

END DATE: 6-5-98

END TIME: 1600

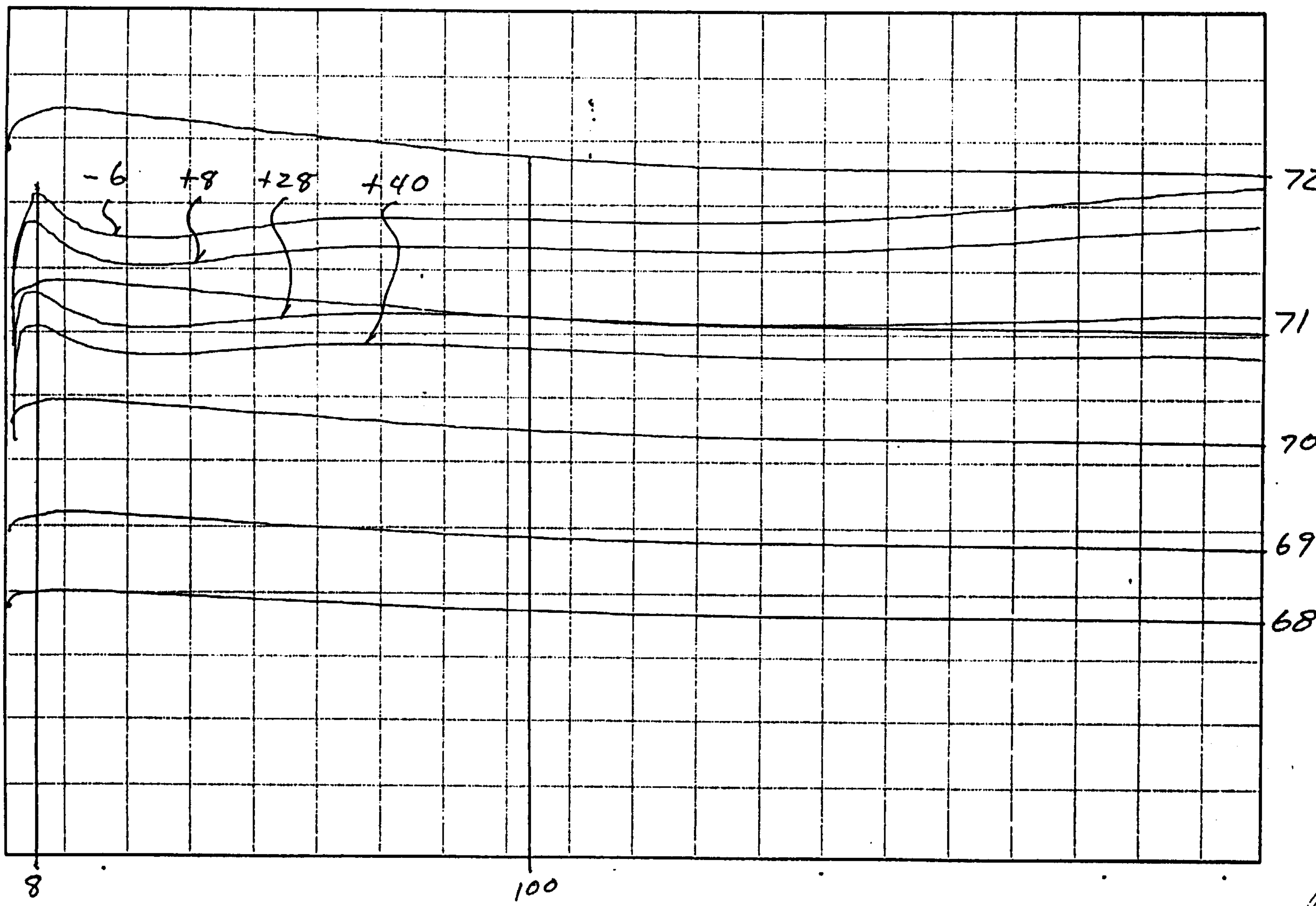
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-13
Serial No. 7A23
Date 6-5-98
Tested By 77?

Amb Temp +23°C



Frequ(cy (Mhz)

QA 1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.6	0.4	1.0		
				X						20					
	X	X								50	-2.6	0.4	1.0		
X	X	X	X	X	X	X	X			100	-2.6	0.4	1.0		
X										150					
			X	X	X	X	X	X		200					
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-24.1	-27.7	3.6	1.19

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

PART NO. 1331562-13G

SPACEK QA — DATE 6-29-98 ACC REJ

SER NO. 7A23

TEST FAILURE: ________

TESTED BY: 777

FAILURE ANALYSIS NO. ________

END DATE: 6-5-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 6-24-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.0	-23.10	-25.20	2.1	2.9	3.8	QA 1	
+8	43.1	-23.30	-25.30	2.0	3.1	3.8	QA 1	
+28	43.2	-23.50	-25.50	2.0	3.1	3.8	QA 1	
+40	43.3	-23.8	-25.80	2.0	3.1	3.8	QA 1	

Noise figure change 0.2 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NE∆T-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 6-23-98 Ambient Room Temperature °C: 25

Attach computer generated *NE∆T* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.063

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ

PART NO. 1331562-13E

SPACEK QA DATE 6-29-98 ACC QA 1 REJ

SER NO. 7A23

TEST FAILURE:

TESTED BY: 77

FAILURE ANALYSIS NO.

END DATE: 6-24-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

Report No. 11491
June 1999

Channel 4 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-14, S/N: 7A64)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.35	0.50	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	71.24	1.63	2.0	QA 1	
10.00	71.30				
10.04	71.37				
ΔGv =	0.13 dB				

		DATE	ACC	REJ
PART NO. 1331562-14F	SPACEK QA	10-28-98	QA 1	

SER NO. 7A64

TEST FAILURE:

TESTED BY: 77H

FAILURE ANALYSIS NO.

END DATE: 6-5-98

END TIME: 1600

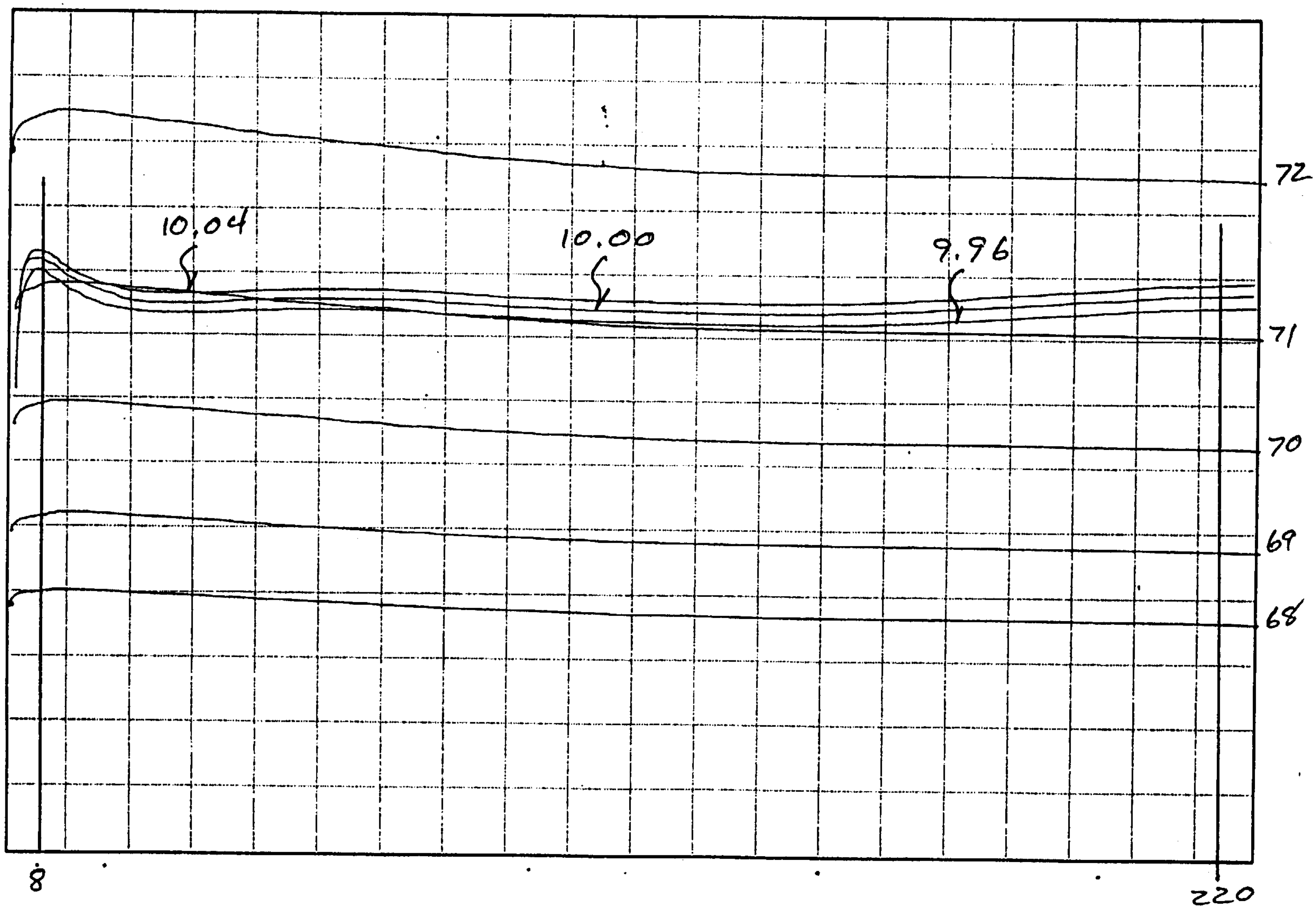
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-14G
Serial No. 7A 64
Date 6-6-98
Tested By 77V

Amb Temp +23°C



QA 1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 -6	GT1 71.95			QA 1	
		* 0.019	0.035dB/°C		
T2 +8	GT2 71.69				
		* 0.025	0.020dB/°C		QA 1
T3 +28	GT3 71.19				
		* 0.033	0.035dB/°C	QA 1	
T4 +40	GT4 70.80				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4 \qquad \Delta G_T = 1.15 \text{ dB}$$

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 1.68 dB Spec 1.4dB ACC____ REJ QA 1

DATE ACC ~~REJ~~ ENGINEERING DATA ONLY. See AE24865 PARA. 3.2.1.15.1 acceptable

PART NO. 1331562-14G SPACEK QA 10-28-98 ___ QA 1

SER NO. 7A64 TEST FAILURE: ______

TESTED BY: 777 FAILURE ANALYSIS NO. ______

END DATE: 6-5-98

END TIME: 1600

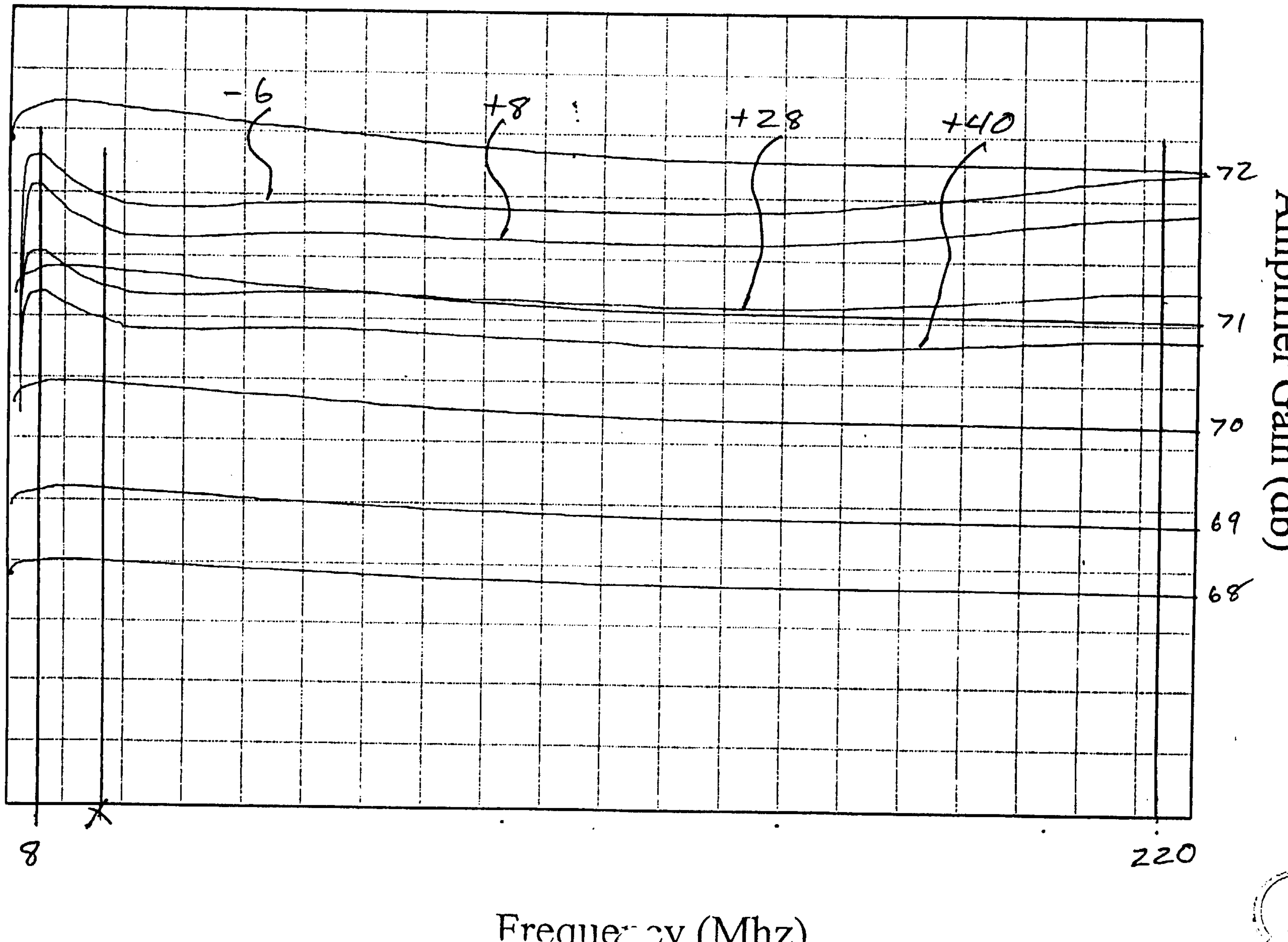
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-HG
Serial No. 7A64
Date 6-6-98
Tested By 77

Amb Temp 23°C



QA 1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH # 11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.2	0.8	1.0	QA 1	
				X						20					
	X	X								50					
X	X	X	X	X	X	X	X			100	-2.4	0.6	1.0	QA 1	
X										150					
			X	X	X	X	X	X		200	-2.3	0.7	1.0	QA 1	
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-20.2	-23.9	3.7	1.11

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

PART NO. 1331562-14F

SER NO. 7A64

TESTED BY: 77

END DATE: 6-5-98

END TIME: 1600

	DATE	ACC	REJ
SPACEK QA	10-28-98	QA 1	

TEST FAILURE:

FAILURE ANALYSIS NO.

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 11-18-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	~~ACC~~	REJ
-6	43.0	-18.70	-20.65	1.95	3.2	3.8	QA 1	
+8	43.1	-19.00	-20.90	1.90	3.3	3.8	QA 1	
+28	43.2	-19.30	-21.20	1.90	3.3	3.8	QA 1	
+40	43.3	-19.50	-21.40	1.90	3.3	3.8	QA 1	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ_____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 11-24-98 Ambient Room Temperature °C: 24

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.048

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

~~ACC~~ QA 1 REJ _____

PART NO. 1331562-14F

SPACEK QA — DATE 11-25-98 ACC QA 1 REJ _____

SER NO. 7A64

TEST FAILURE: _____

TESTED BY: 77#

FAILURE ANALYSIS NO. _____

END DATE: 11-25-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

Report No. 11491
June 1999

Channel 5 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-15, S/N: 7A65)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
~~7a~~ 0.40 77	0.50	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	70.99	2.25	2.0		QA 1
10.00	71.08				
10.04	71.17				
ΔGv =	0.18 dB				

ENGINEERING DATA ONLY. SEE AE24869C PARA. 3.2.1.15.2

acceptable

				DATE	ACC	REJ
PART NO.	1331562-15G	SPACEK QA		10-28-98		QA 1
SER NO.	7A65	TEST FAILURE:				
TESTED BY:	77A	FAILURE ANALYSIS NO.				
END DATE:	6-5-98					
END TIME:	1600					

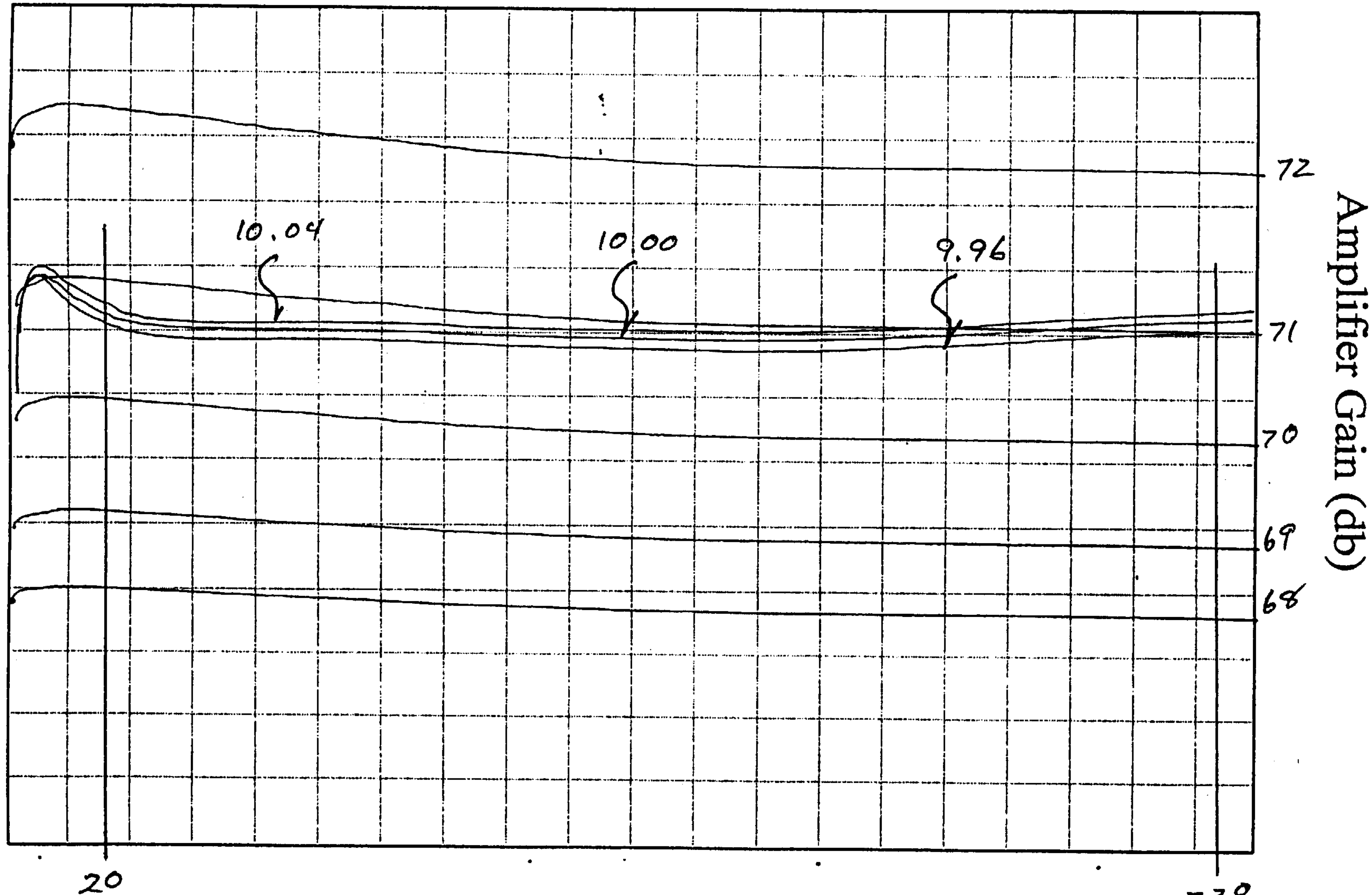
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Amb Temp +23°c

Model No. 1331562-15G
Serial No. 7A65
Date 6-6-98
Tested By 77[illegible]



TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 −6	G_{T1} 71.62				
		* 0.016	0.035dB/°C	QA 1	
T2 +8	G_{T2} 71.39				
		* 0.024	0.020dB/°C		QA 1
T3 +28	G_{T3} 70.91				
		* 0.022	0.035dB/°C	QA 1	
T4 +40	G_{T4} 70.65				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4$$

ΔG_T = 0.97 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 1.55 dB Spec 1.4dB ACC_____ REJ QA 1

	DATE	ACC	REJ
SPACEK QA	10-28-98		QA 1

ENGINEERING DA. ONLY. SEE AE24869 PARA. 3.2.1.15.1 acceptable

PART NO. 1331562-15E

SER NO. 7A65

TESTED BY: 77K

END DATE: 6-5-98

END TIME: 1600

TEST FAILURE: ________

FAILURE ANALYSIS NO. ________

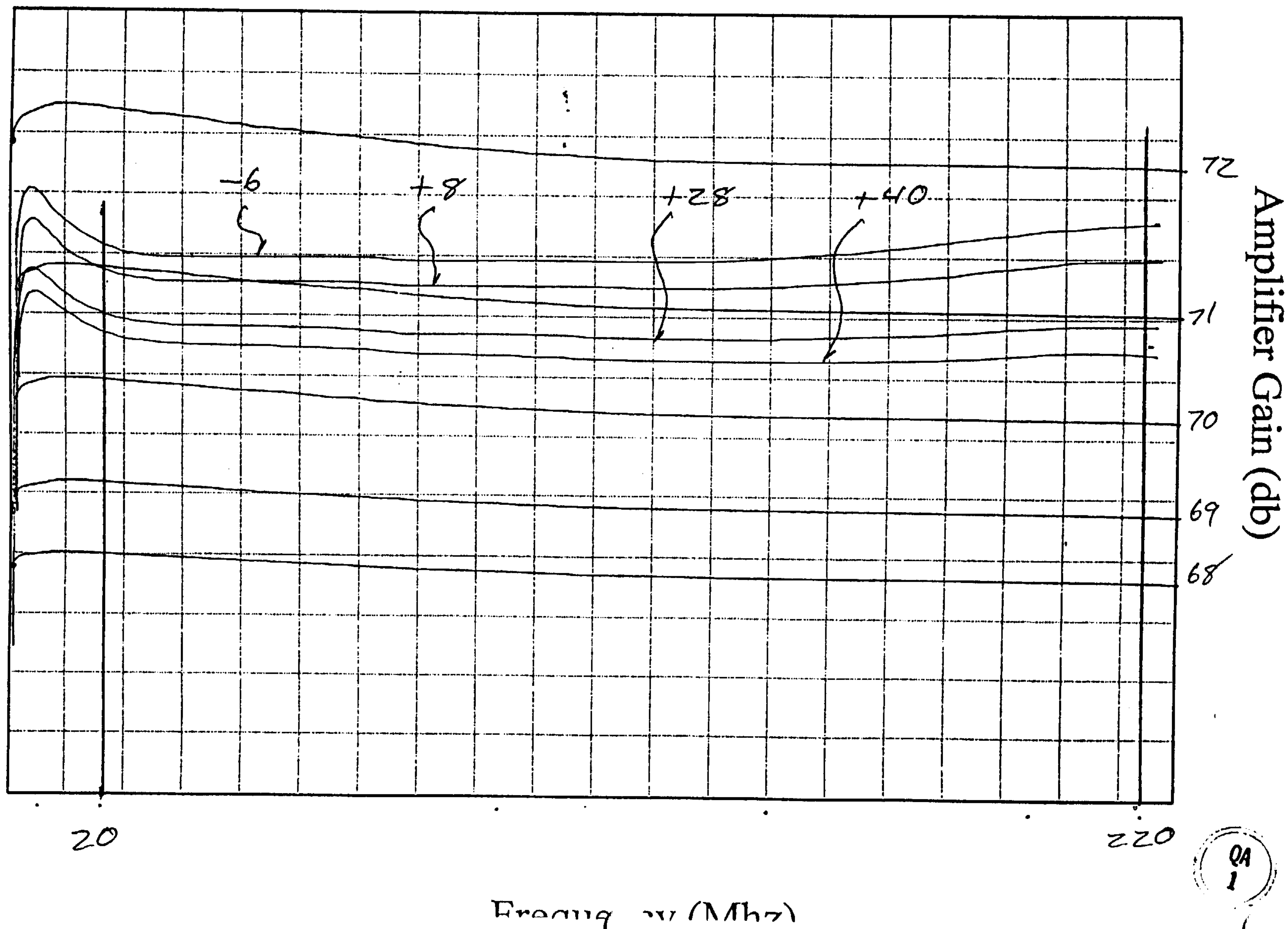
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-15G
Serial No. 7A65
Date 6-6-98
Tested By [illegible]

Amb Temp +23°C



QA 1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10					
				X						20	-2.4	0.6	1.0	QA 1	
	X	X								50					
X	X	X	X	X	X	X	X			100	-2.3	0.7	1.0	QA 1	
X										150					
			X	X	X	X	X	X		200	-2.2	0.8	1.0	QA 1	
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-21.3	-24.8	3.5	1.27

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

			DATE	ACC	REJ
PART NO. 1331562-15F		SPACEK QA	10-28-98	QA 1	
SER NO. 7A65		TEST FAILURE:			
TESTED BY: 77H		FAILURE ANALYSIS NO.			
END DATE: 6-5-98					
END TIME: 1600					

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 11-18-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.2	-19.90	-21.80	1.90	3.3	3-8	QA 1	
+8	43.3	-20.10	-22.00	1.90	3.3	3-8	QA 1	
+28	43.4	-20.40	-22.30	1.90	3.3	3.8	QA 1	
+40	43.5	-20.60	-22.45	1.85	3.4	3.8	QA 1	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 11-25-98 Ambient Room Temperature °C: 24

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.045

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ

PART NO. 1331562-15F

SPACEK QA DATE 11-25-98 ACC QA 1 REJ

SER NO. 7A65

TEST FAILURE:

TESTED BY: 77#

FAILURE ANALYSIS NO.

END DATE: 11-25-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

Report No. 11491
June 1999

Channel 6 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-16, S/N: 7A66)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0,50	0.50	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	$\Delta G/\Delta V$	SPEC. $\Delta G/\Delta V$	ACC	REJ
9.96	70.99	2.25	2.0		QA 1
10.00	71.08				
10.04	71.17				
ΔG_V =	0.18 dB				

ENGINEERING DATA ONLY, SEE AE24869C PARA. 3.2.1.15-2

acceptable

			DATE	ACC	REJ
PART NO. 1331562-16G		SPACEK QA	10-28-98		QA 1
SER NO. 7A66		TEST FAILURE:			
TESTED BY: 77H		FAILURE ANALYSIS NO.			
END DATE: 6-5-98					
END TIME: 1600					

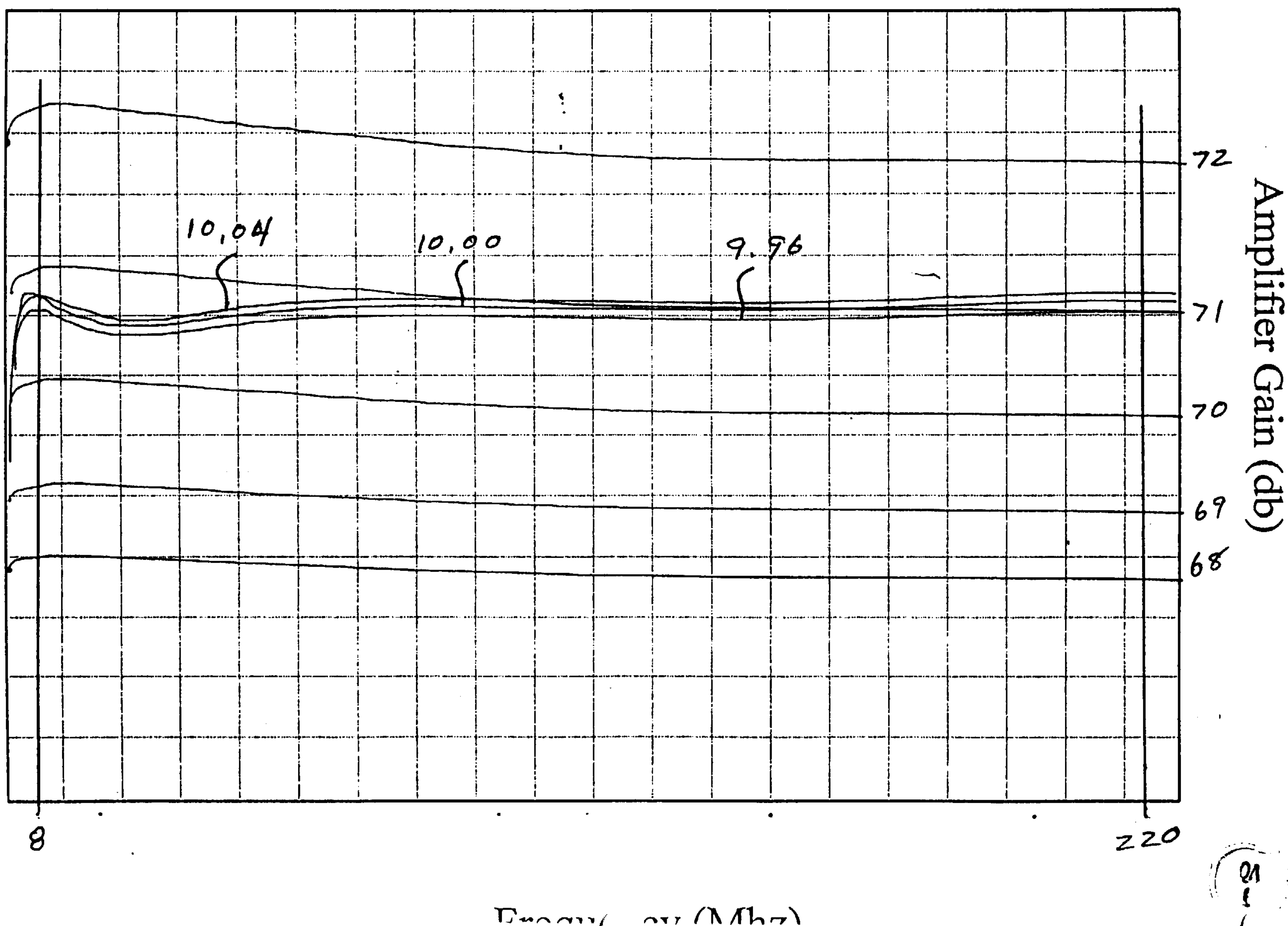
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-16G
Serial No. 7A66
Date 6-6-98
Tested By 77H

Amb Temp +23°C



TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	$\Delta G/\Delta T$	SPEC	ACC	REJ
T1 -6	G_{T1} 71.73				
		* 0.022	0.035dB/°C	QA 1	
T2 +8	G_{T2} 71.42				
		* 0.022	0.020dB/°C		QA 1
T3 +28	G_{T3} 70.98				
		* 0.033	0.035dB/°C	QA 1	
T4 +40	G_{T4} 70.58				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \qquad i = 1,2,3,4 \qquad \Delta G_T = \underline{1.15}\ \text{dB}$$

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 1.73 dB Spec 1.4dB ACC_____ REJ QA 1

DATE ACC REJ

ENGINEERING DATA ONLY. SEE AE248. PARA. 3.2.1.15.1 acceptable

PART NO. 1331562-16B SPACEK QA 10-28-98 ___ QA 1

SER NO. 7A66 TEST FAILURE: __________

TESTED BY: 77H FAILURE ANALYSIS NO. __________

END DATE: 6-5-98

END TIME: 1600

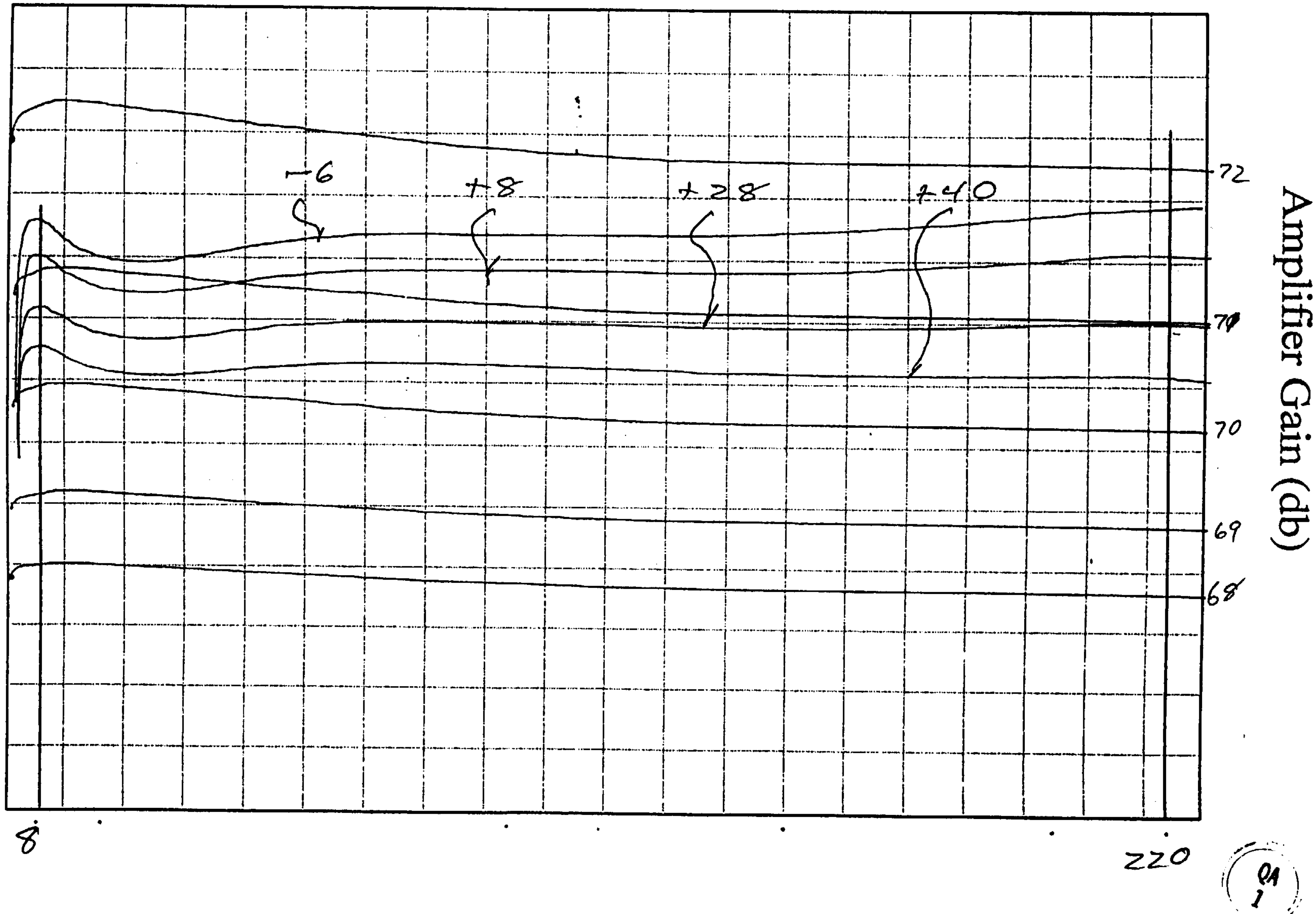
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Amb Temp 23°C

Model No. 1331562-16 G
Serial No. 7A 66
Date 6-6-98
Tested By ???



QA 1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH # 11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.6	0.4	1.0	QA 1	
				X						20					
	X	X								50					
X	X	X	X	X	X	X	X			100	-2.7	0.3	1.0	QA 1	
X										150					
			X	X	X	X	X	X		200	-2.7	0.3	1.0	QA 1	
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-20.4	-24.1	3.7	1.11

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

PART NO. 1331562-16F

SER NO. 7A66

TESTED BY: [signature]

END DATE: 6-5-98

END TIME: 1600

	DATE	ACC	REJ
SPACEK QA	10-28-98	QA 1	

TEST FAILURE:

FAILURE ANALYSIS NO.

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 11-19-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.0	-19.30	-21.50	2.20	2.8	3.8	QA 1	
+8	43.1	-19.50	-21.65	2.15	2.9	3.8	QA 1	
+28	43.2	-19.80	-21.95	2.15	2.9	3.8	QA 1	
+40	43.3	-20.10	-22.25	2.15	2.9	3.8	QA 1	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ______
NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 11-24-98 Ambient Room Temperature °C: 25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.034

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ ______

PART NO. 1331562-16F

SPACEK QA DATE 11-25-98 ACC QA 1 REJ ______

SER NO. 7A66

TEST FAILURE: ______

TESTED BY: 77

FAILURE ANALYSIS NO. ______

END DATE: 11-25-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

Report No. 11491
June 1999

Channel 7 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-17, S/N: 7A57)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.36	0.50	QA	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	70.99	2.25	2.0		QA 1
10.00	71.08				
10.04	71.17				
ΔGv =	0.18 dB				

		DATE	ACC	REJ
PART NO. 1331562-17F	SPACEK QA	10-28-98		QA 1

ENGINEERING DATA ONLY, SEE AE24869C PARA. 3.2.1.15.2 acceptable

SER NO. 7A57

TEST FAILURE:

TESTED BY: 777

FAILURE ANALYSIS NO.

END DATE: 6-5-98

END TIME: 1600

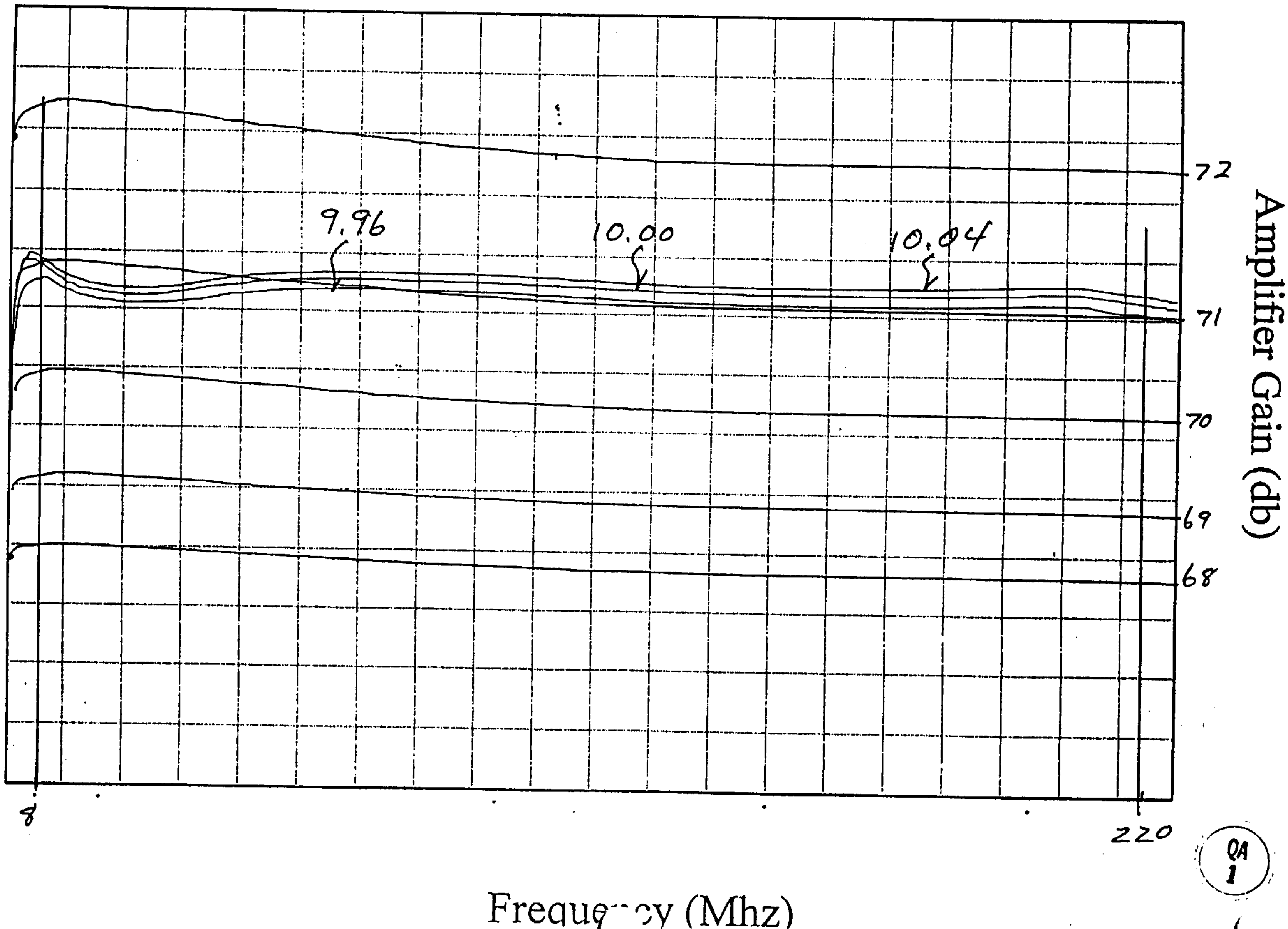
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-176
Serial No. 7A57
Date 6-6-98
Tested By 77Y

Amb Temp 23°C



QA 1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 -6	GT1 71.79				
		* 0.018	0.035dB/°C	QA 1	
T2 +8	GT2 71.54				
		* 0.020	0.020dB/°C	QA 1	
T3 +28	GT3 71.04				
		* 0.027	0.035dB/°C	QA 1	
T4 +40	GT4 70.72				

• Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4$$

ΔG_T = 1.07 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4$ = 1.65 dB Spec 1.4dB ACC_____ REJ QA 1

DATE ACC REJ

ENGINEERING DATA ONLY. SEE A62486 PARA. 3.2.1.15.1 acceptable

PART NO. 1331562-17B SPACEK QA 10-28-98 QA 1

SER NO. 7A57 TEST FAILURE: __________

TESTED BY: [signature] FAILURE ANALYSIS NO. __________

END DATE: 6-5-98

END TIME: 1600

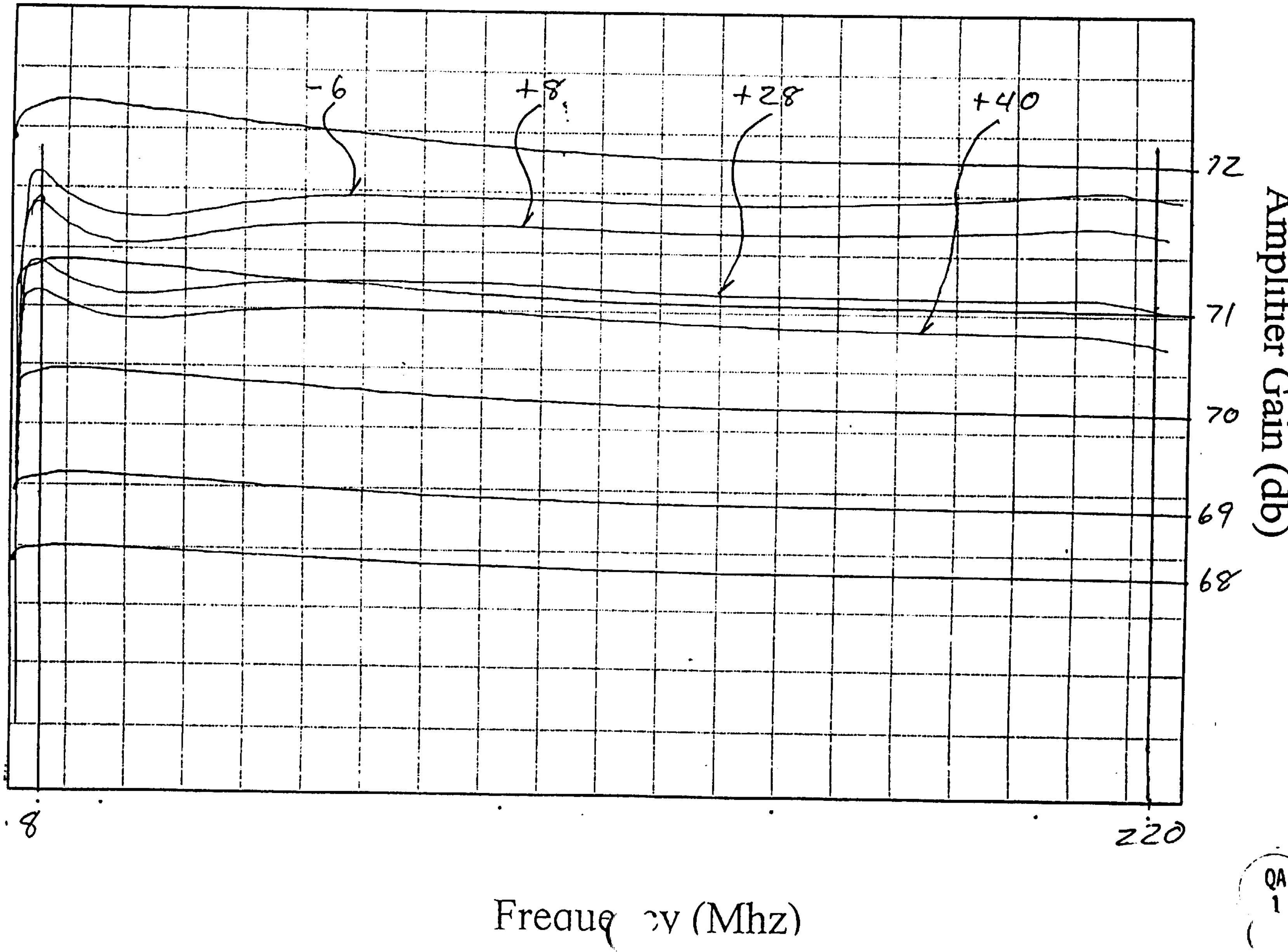
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara, CA, 93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-17G
Serial No. 7A57
Date 6-6-98
Tested By 77H

Amb Temp 23°C



QA 1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.3	0.7	1.0	QA 1	
				X						20					
	X	X								50					
X	X	X	X	X	X	X	X			100	-2.4	0.6	1.0	QA 1	
X										150					
			X	X	X	X	X	X		200	-2.4	0.6	1.0	QA 1	
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-20.2	-23.8	3.6	1.19

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

PART NO. 1331562-17E

SPACEK QA — DATE: 10-28-98 ACC: QA 1 REJ:

SER NO. 7A57

TEST FAILURE:

TESTED BY: TTT

FAILURE ANALYSIS NO.

END DATE: 6-5-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 11-19-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.1	-19.20	-21.35	2.15	2.8	3.8	QA 1	
+8	43.2	-19.40	-21.50	2.10	2.9	3.8	QA 1	
+28	43.3	-19.70	-21.80	2.10	2.9	3.8	QA 1	
+40	43.4	-19.90	-22.00	2.10	2.9	3.8	QA 1	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ______

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 11-24-98 Ambient Room Temperature °C: 25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.051

Record Nps(K) 0.09 for dash number from Aerojet specification AE-24869, Table II. Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA REJ

PART NO. 1331562-176

SPACEK QA DATE 11-25-98 ACC QA 1 REJ

SER NO. 7A57

TEST FAILURE:

TESTED BY: 777

FAILURE ANALYSIS NO.

END DATE: 11-25-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

Report No. 11491
June 1999

Channel 8 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-18, S/N: 7A68)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

SDAR# 35
12/1/98

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.62	0.5		QA 1

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	70.11	2.25	2.0		QA 1
10.00	70.20				
10.04	70.29				
ΔGv =	0.18 dB				

ENGINEERING DATA ONLY. SEE AE24869C PARA. 3.2.1.15.2

acceptable

		DATE	ACC	REJ
PART NO. 1331562-18G	SPACEK QA	10-28-98		QA 1
SER NO. 7A68	TEST FAILURE:			
TESTED BY: 777	FAILURE ANALYSIS NO.			
END DATE: 6-6-98				
END TIME: 1600				

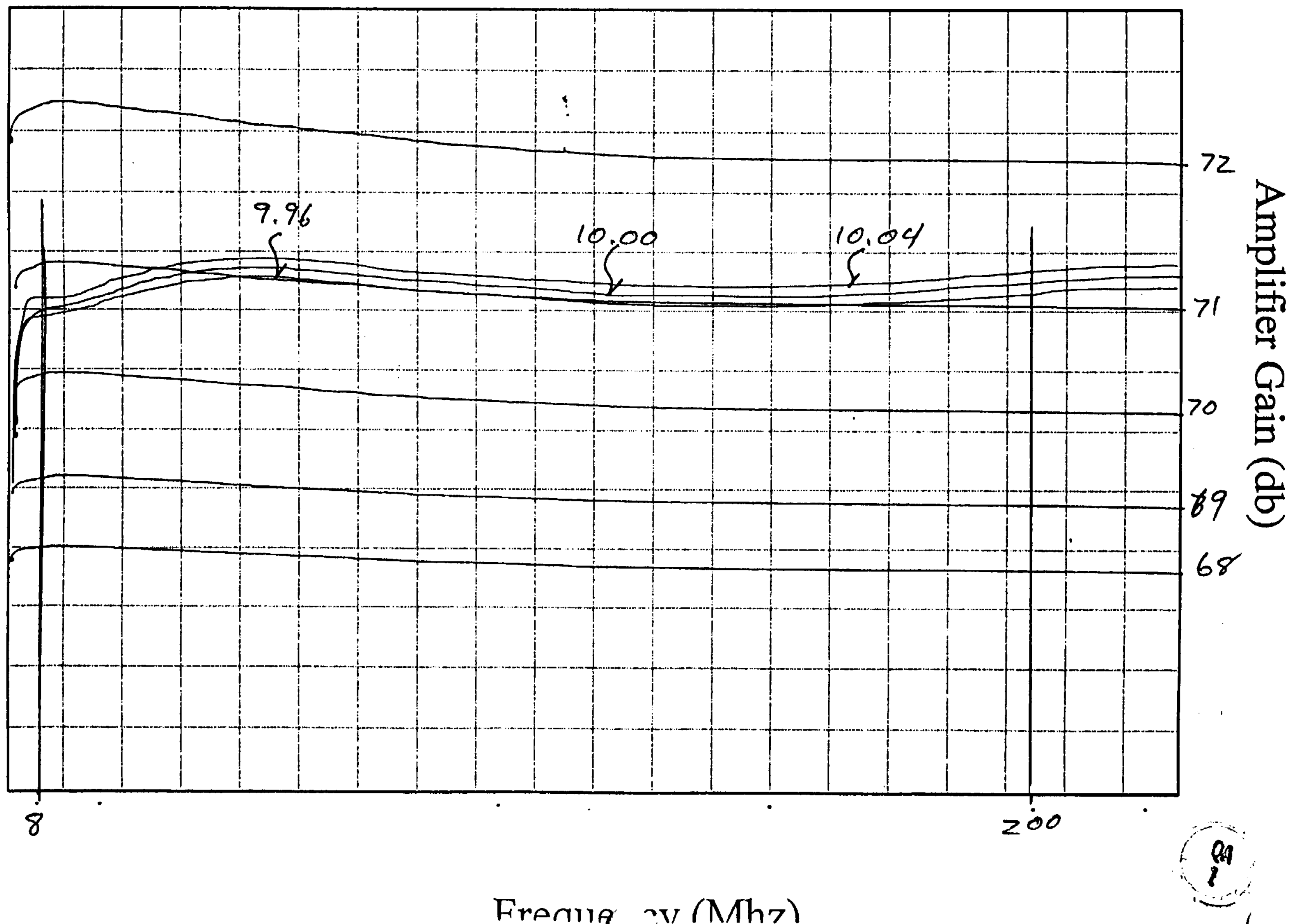
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-186
Serial No. 7A68
Date 6-6-98
Tested By 77Y

Amb Temp 23°c



TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 -6	GT1 71.84				
		* 0.014	0.035dB/°C	QA 1	
T2 +8	GT2 71.65				
		* 0.025	0.020dB/°C		QA 1
T3 +28	GT3 71.15				
		* 0.023	0.035dB/°C	QA 1	
T4 +40	GT4 70.88				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4$$

$\Delta G_T =$ 0.96 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 1.54 dB Spec 1.4dB ACC_____ REJ QA 1

DATE ACC REJ ENGINEERING DAT. ONLY. SEE AE2486? PARA. 3.2.1.15. acceptable

PART NO. 1331562-18E SPACEK QA 10-28-98 ___ QA 1

SER NO. 7A68 TEST FAILURE: ________

TESTED BY: 777 FAILURE ANALYSIS NO. ________

END DATE: 6-5-98

END TIME: 1600

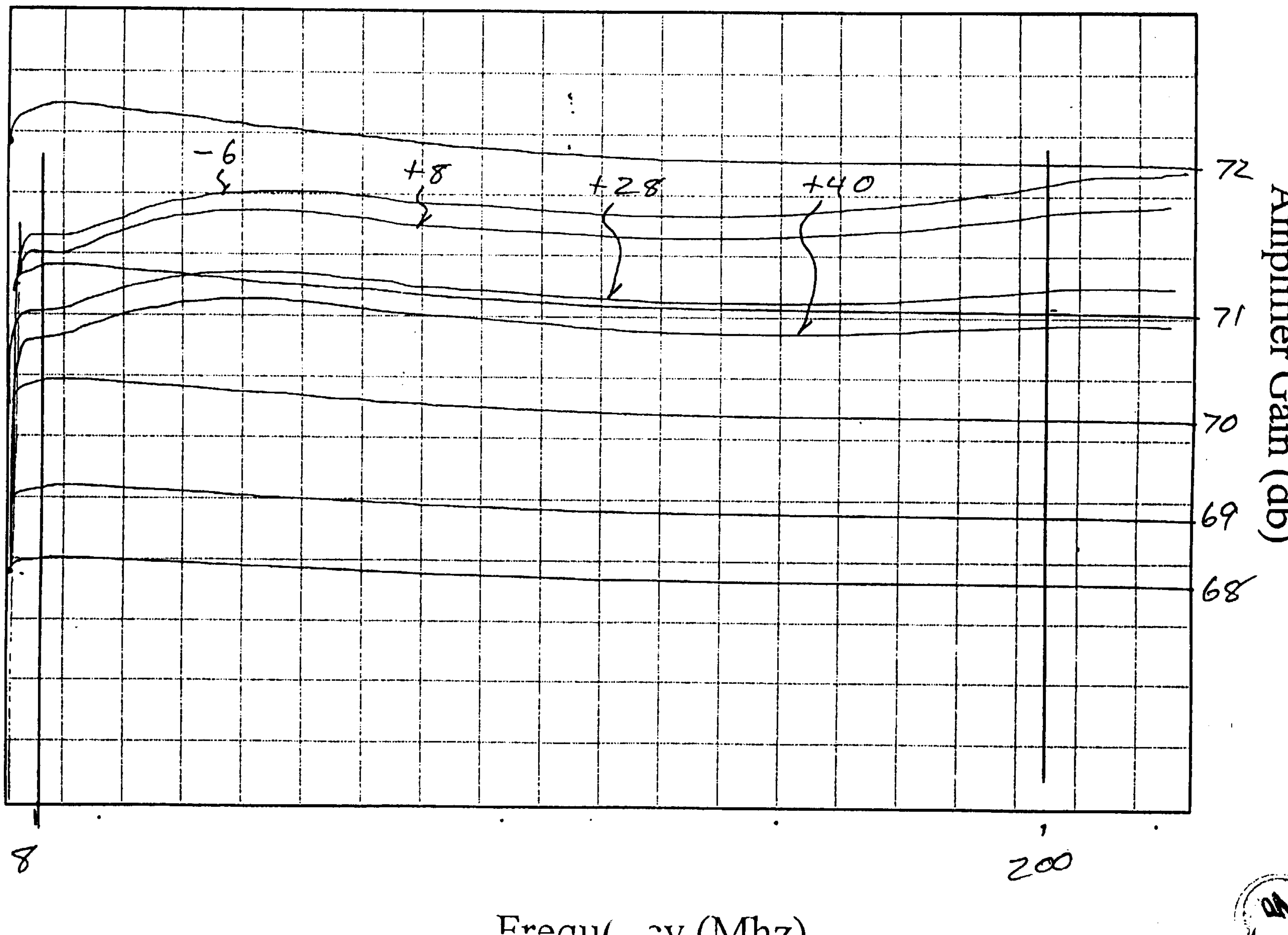
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-18 G
Serial No. 7A68
Date 6-6-98
Tested By 77[illegible]

Amb Temp 23°C



TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.5	0.5	1.0	S-1	
				X						20	-				
	X	X								50					
X	X	X	X	X	X	X	X			100	-2.6	0.4	1.0	S-1	
X										150					
			X	X	X	X	X	X		200	-2.6	0.4	1.0	S-1	
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-20.1	-23.7	3.6	1.19

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

PART NO. 1331562- 18F

SPACEK QA — DATE 10-28-98 — ACC QA 1 — REJ

SER NO. 7A68

TEST FAILURE:

TESTED BY: 77

FAILURE ANALYSIS NO.

END DATE: 6-5-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 11-19-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.3	-18.50	-20.30	1.80	3.5	3.8	QA 1	
+8	43.4	-18.80	-20.60	1.80	3.5	3.8	QA 1	
+28	43.5	-19.10	-20.90	1.80	3.5	3.8	QA 1	
+40	43.6	-19.30	-21.10	1.80	3.5	3.8	QA 1	

Noise figure change 0 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 11-24-98 Ambient Room Temperature °C: 24

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.039

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ

PART NO. 1331562-18B SPACEK QA

DATE 11-25-98 ACC QA 1 REJ

SER NO. 7A68 TEST FAILURE:

TESTED BY: 777

FAILURE ANALYSIS NO.

END DATE: 11-25-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

Report No. 11491
June 1999

Channels 9-14 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-19, S/N: 7A59)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.54	0.50		QA 1

SDAR # 35
12/1/98

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	60.45	2.38	2.0		QA 1
10.00	60.54				
10.04	60.64				
ΔGv =	0.19 dB				

ENGINEERING DATA ONLY. SEE AE24869C PARA. 3.2.1.15.2
acceptable condition

			DATE	ACC	REJ
PART NO. 1331562-19B		SPACEK QA	10-28-98		QA 1
SER NO. 7A59		TEST FAILURE:			
TESTED BY: 777		FAILURE ANALYSIS NO.			
END DATE: 6-5-98					
END TIME: 1600					

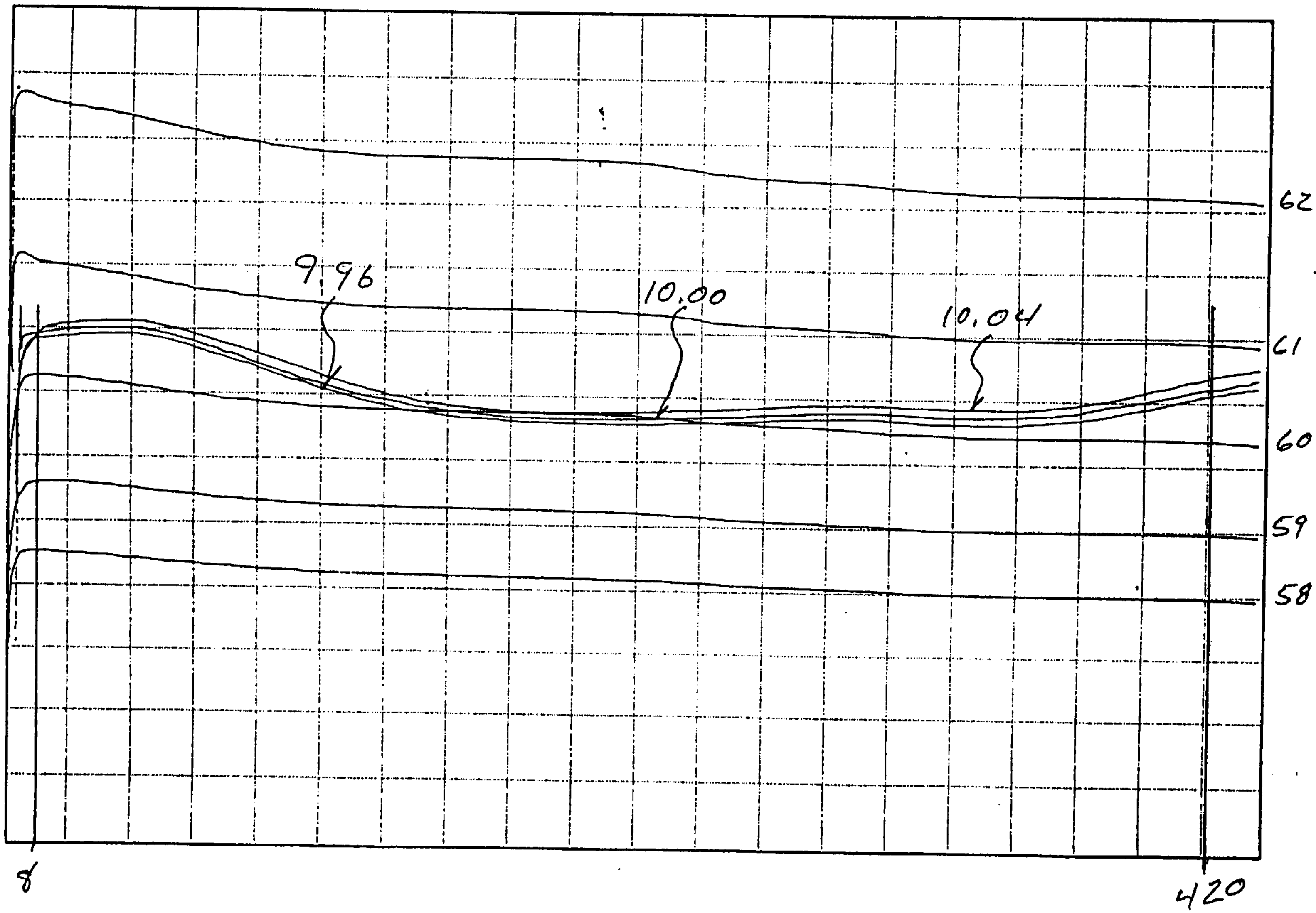
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-196
Serial No. 7A59
Date 5-27-98
Tested By

Amb Temp 23°C



TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 −6	G_{T1} 61.67				
		* 0.030	0.035dB/°C	QA 1	
T2 +8	G_{T2} 61.25				
		* 0.041	0.020dB/°C		QA 1
T3 +28	G_{T3} 60.43				
		* 0.046	0.035dB/°C		QA 1
T4 +40	G_{T4} 59.88				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4 \qquad \Delta G_T = \underline{1.79}\ \text{dB}$$

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 2.38 dB Spec 1.4dB ACC_____ REJ QA 1

	DATE	ACC	REJ
PART NO. 1331562-19B			
SPACEK QA	10-28-98		QA 1
SER NO. 7A59			
TEST FAILURE:			
TESTED BY: [signature]			
FAILURE ANALYSIS NO.			
END DATE: 6-5-98			
END TIME: 1600			

ENGINEERING DATA ONLY. SEE AE24869 PARA. 3.2.1.15.1 acceptable.

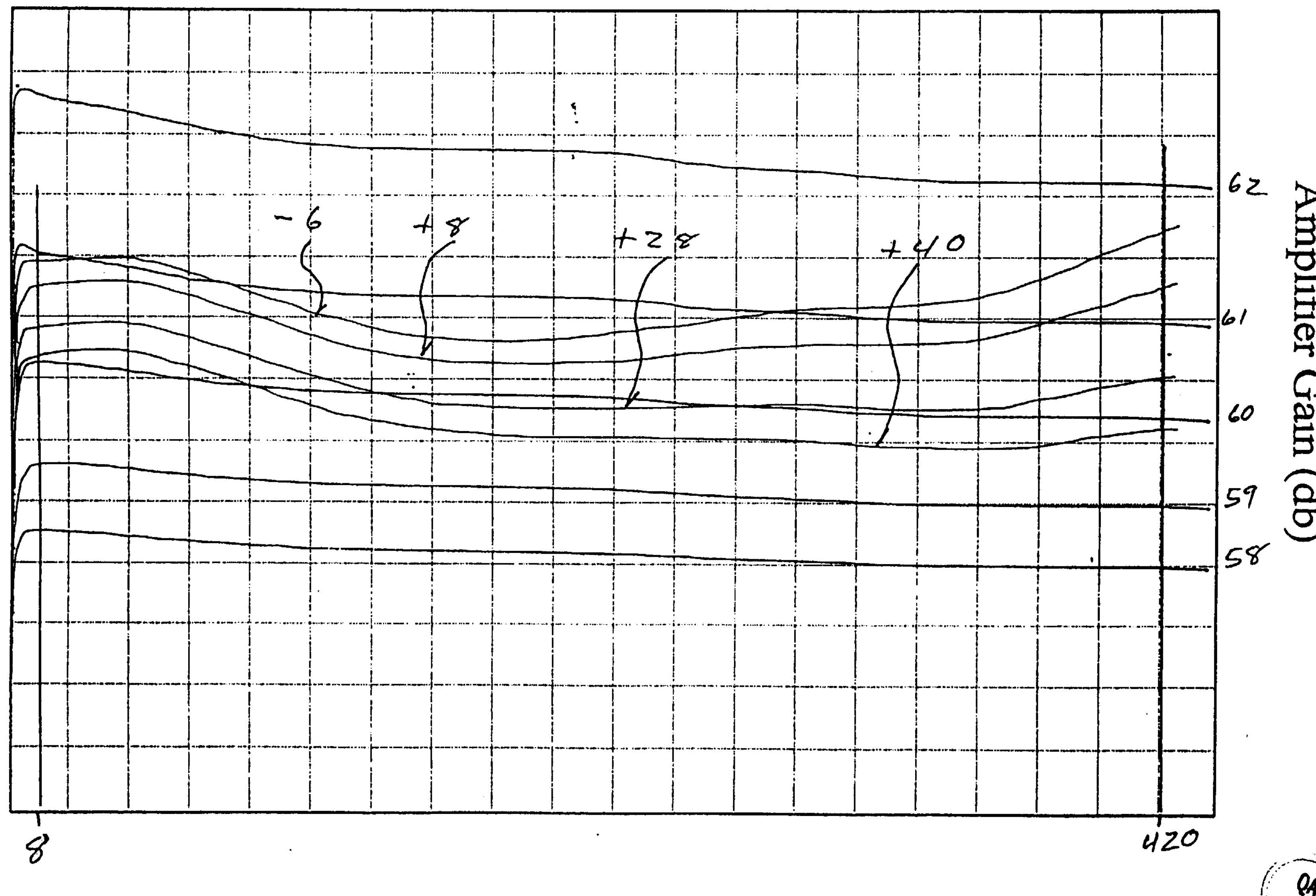
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No.	133/562-196
Serial No.	7A59
Date	5-27-98
Tested By	77V

Amb Temp 23°C



QA 1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.5	0.5	1.0	QA 1	
				X						20					
	X	X								50					
X	X	X	X	X	X	X	X			100					
X										150					
			X	X	X	X	X	X		200	-2.5	0.5	1.0	QA 1	
								X		400	-2.3	0.7	1.0	QA 1	
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-26.2	-29.7	3.5	1.27

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

PART NO. 1331562- 19F

SER NO. 7A59

TESTED BY: [illegible]

END DATE: 6-5-98

END TIME: 1600

	DATE	ACC	REJ
SPACEK QA	10-28-98	QA 1	

TEST FAILURE:

FAILURE ANALYSIS NO.

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 11-19-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-5	50.7	-25.40	-27.30	1.90	3.3	3.5	QA 1	
+8	50.7	-25.70	-27.55	1.85	3.4	3.5	QA 1	
+28	50.8	-26.10	-27.95	1.85	3.4	3.5	QA 1	
+40	50.9	-26.30	-28.15	1.85	3.4	3.5	QA 1	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ______

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 11-24-98 Ambient Room Temperature °C: 24

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.034

Record Nps(K) 0.07 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ ______

			DATE	ACC	REJ
PART NO. 1331562- 19F		SPACEK QA	11-25-98	QA 1	
SER NO. 7A59		TEST FAILURE:			
TESTED BY: 77		FAILURE ANALYSIS NO.			
END DATE: 11-25-98					
END TIME: 1600					

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

Report No. 11491
June 1999

Channel 9 Amplifier

IF Amplifier (P/N:1331579-8, S/N: 110)

APPENDIX C
ATP1772 DATA SHEET
MODEL NUMBER VD722301
AEROJET P/N 1331579-8

S/N 110

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject ___			4-16-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			4-16-97
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject ___			4-16-97
	Short Open Protection	No Damage	Accept X Reject ___			4-16-97
	Output Coupling	Output shall be AC coupled	Accept X Reject ___			4-16-97
4.4.2	Gain vs. Freq. 5 MHz to 200 MHz	14.5dB Min., 15.5dB Max. -4°C to +40°C Attach x-y plot	Max 15.27 dB Min 15.07 dB Accept X Reject ___	Max 15.20 dB Min 15.01 dB Accept X Reject ___	Max 15.31 dB Min 15.13 dB Accept X Reject ___	4-16-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject ___ 0.20 dB	Accept X Reject ___ 0.19 dB	Accept X Reject ___ 0.18 dB	4-16-97
	Gain Temp. Sensitivity	$\pm$.22 dB from -4°C to +40°C Worse Case	Accept X Reject ___	Accept X Reject ___ 0.10 dB	Accept X Reject ___ 0.08 dB	4-16-97
4.4.3	Gain-Voltage Sensitivity Input Currents	$\leq$.5dB/v Worse Case $\pm$ .2dB for 7.6 to 8.4 Vdc 40ma MAX. 7.6v 8.0v 8.4v Attach X-Y Plot	0.02 dB 32.2 mA 32.9 mA 33.5 mA Accept X Reject ___	0.03 dB 29.8 mA 30.5 mA 31.1 mA Accept X Reject ___	0.02 dB 34.6 mA 35.3 mA 35.9 mA Accept X Reject ___	4-16-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1772 DATA SHEET
MODEL NUMBER VD722301
AEROJET P/N 1331579-8

S/N 110

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject ___			
		5 MHz	0.60 dB	0.40 dB	0.25 dB	
		102.5 MHz	0.60 dB	0.35 dB	0.25 dB	
		200 MHz	0.40 dB	0.20 dB	0.20 dB	4-16-97
4.4.8	Stability	Stable with the input terminated into a 2.5:1 mismatch and the output at all impedance's.	Accept X Reject ___			4-16-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 45 mA	Accept X Reject ___			
		Maximum Current	37.5 mA			4-17-97

NOTE: Review all recorded data and signify acceptance below.

Technician ___ T143 Date: 4-17-97

Quality Assurance ___ Date: 4-21-97

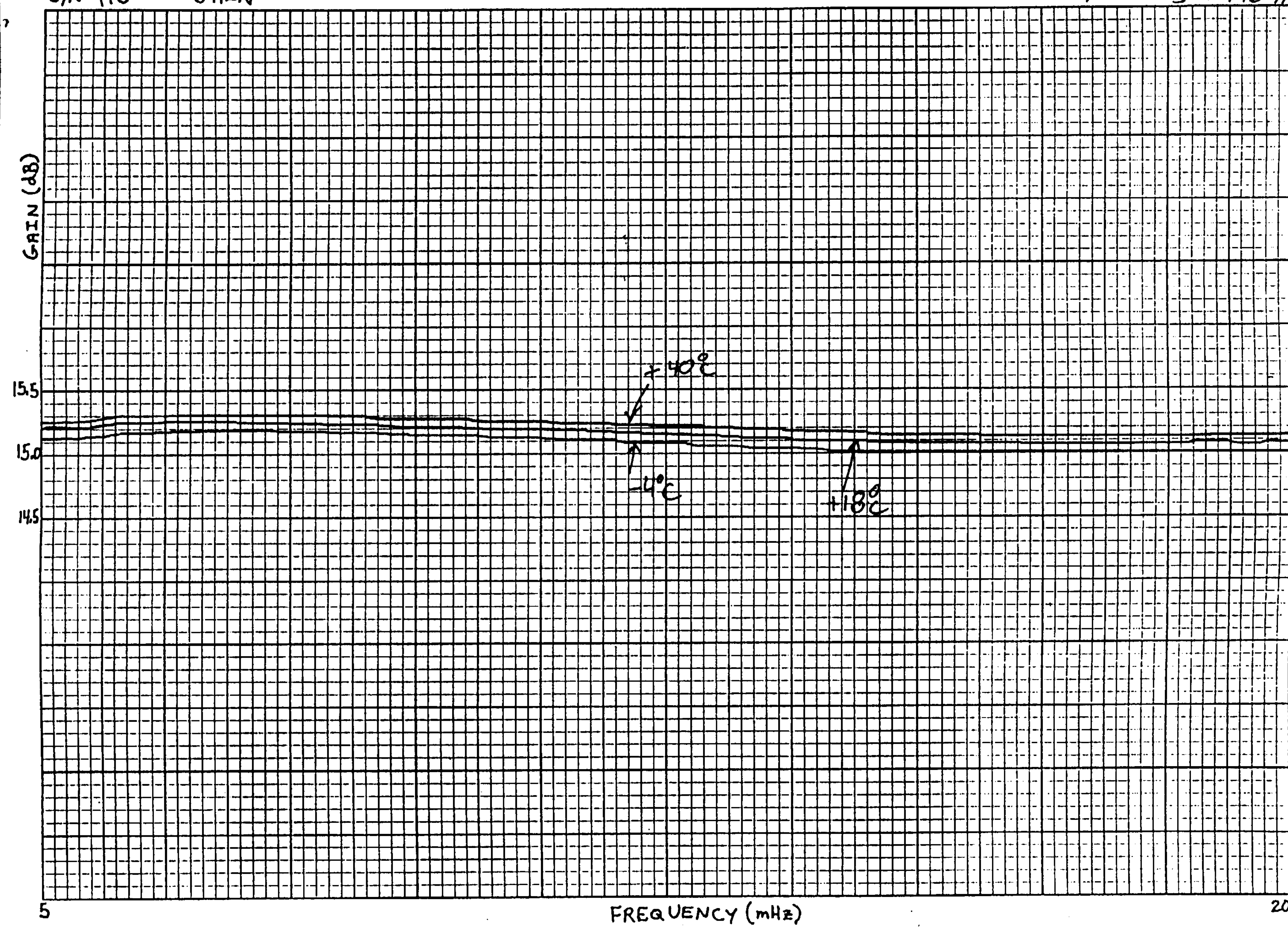
CSI: ___ QC 176 Date: 4-22-97

GSI: ___ Date: 4/17/97

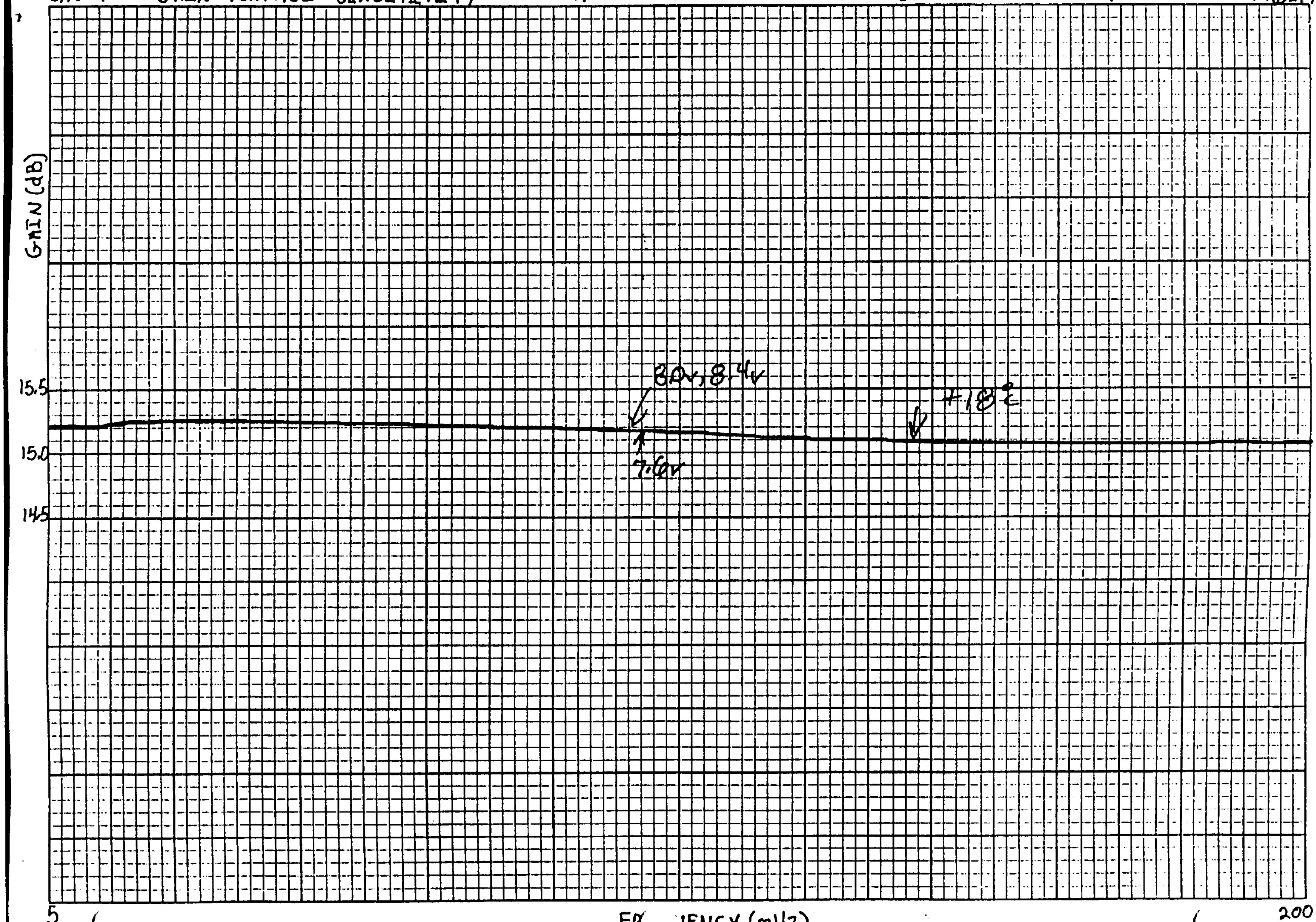
Amplica, Inc. Newbury Park, CA 91320				
DRAWN	SIZE A	FSCM NO. 51025	ATP1772	REV
ISSUED	SCALE		SHEET 36 OF 38	

T143

S/N 110 GAIN P/N 1331579-8 VD722301 1dB/inch SA 4/4/97



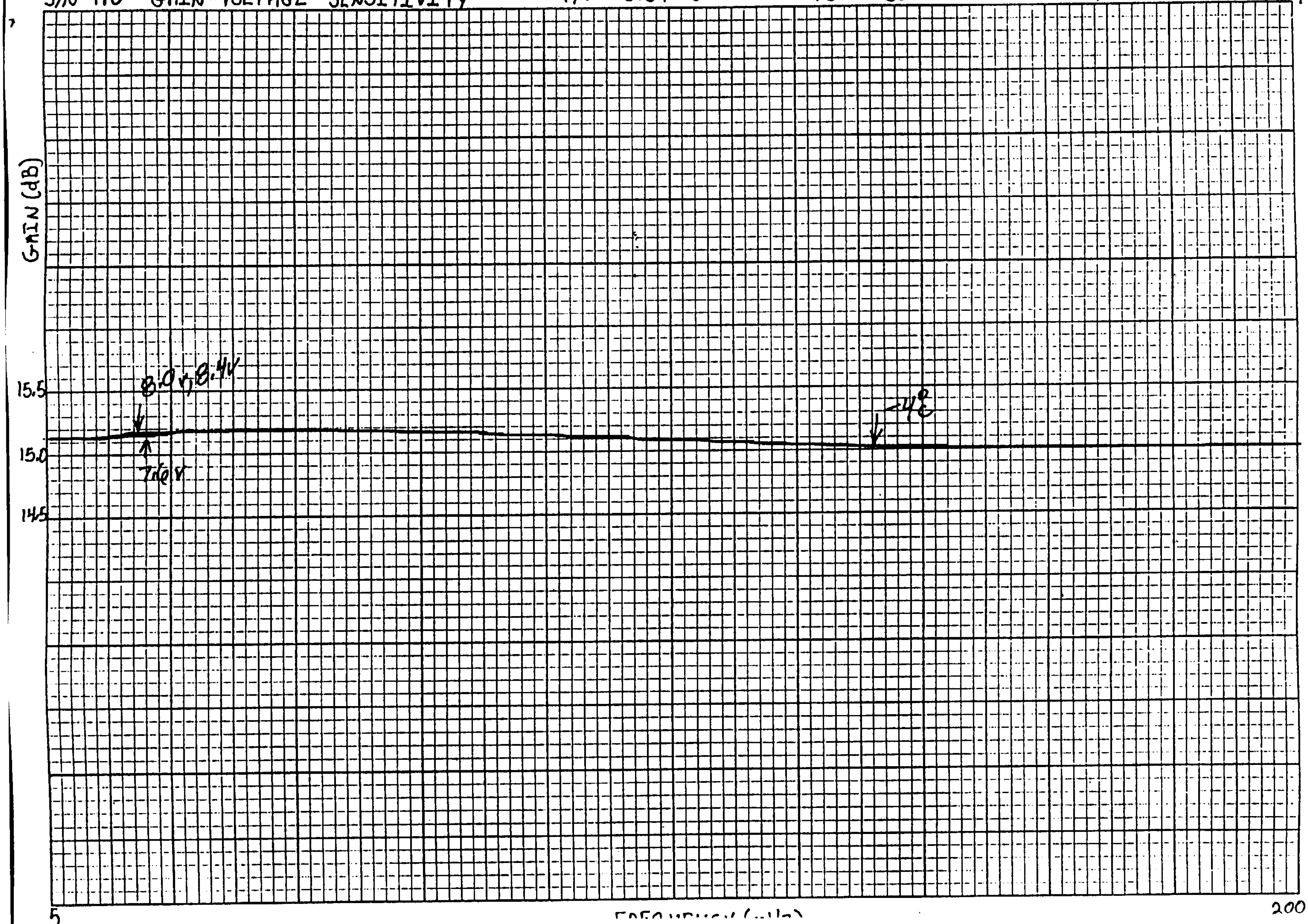
S/N 110 GAIN-VOLTAGE SENSITIVITY P/N 1331579-8 YD 722301 1dB/inch SAS 4-1[illegible]77 (T143)



VLCT KARI 'O-IOI

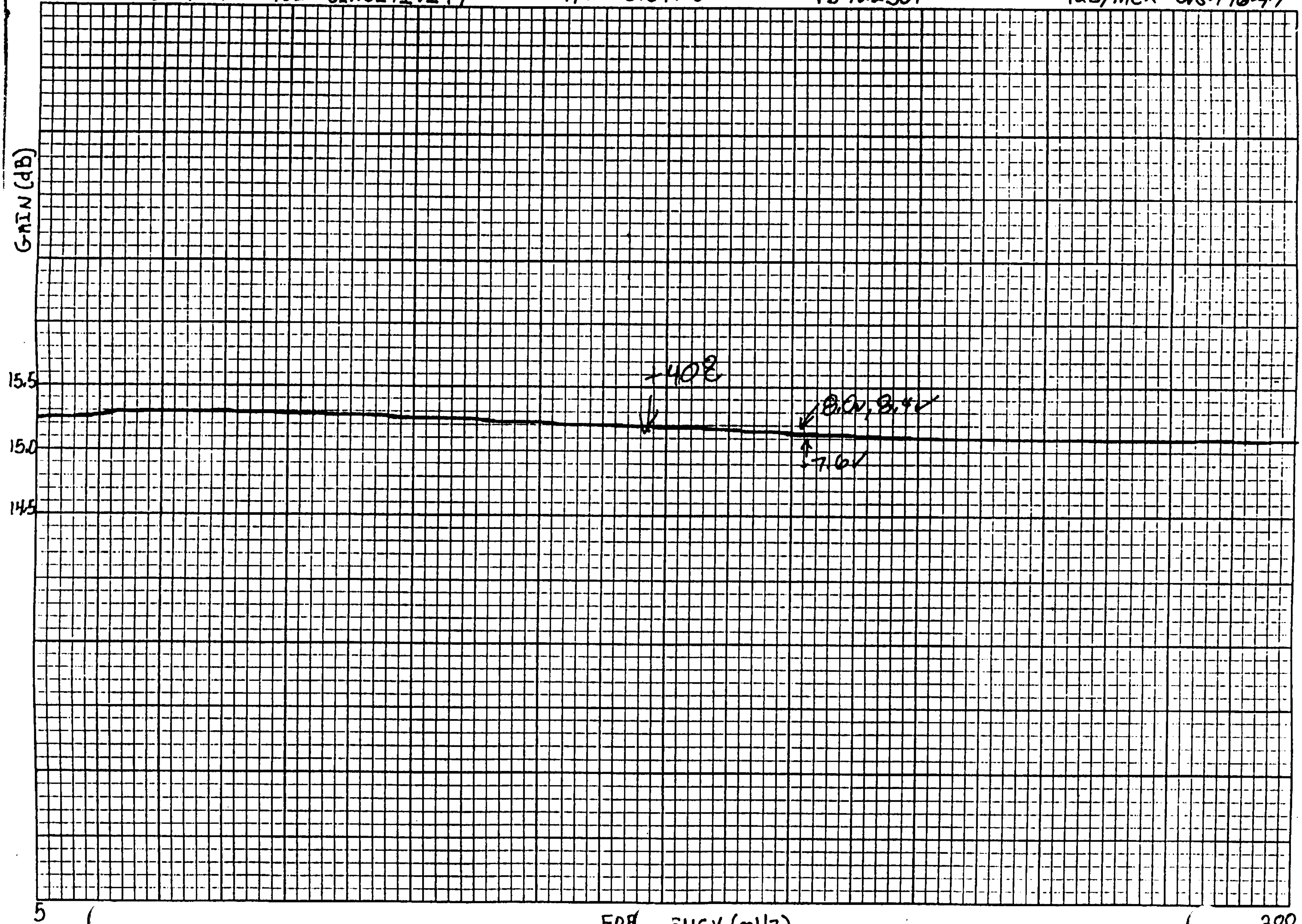
T143

S/N 110 GAIN-VOLTAGE SENSITIVITY P/N 1331579-8 VD 722301 1dB/inch ~~SB~~ 4-16-97



(T143)

S/N 110 GAIN-VOLTAGE SENSITIVITY P/N 1331579-8 VD 722301 1dB/inch SK 4-16-97



Report No. 11491
June 1999

Channel 10 Amplifier

IF Amplifier (P/N:1331579-9, S/N: 109)

APPENDIX C
ATP1773 DATA SHEET
MODEL NUMBER VD622301
AEROJET P/N 1331579-9

S/N 109

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject ___			3-12-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			3-12-97
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject ___			3-12-97
	Short Open Protection	No Damage	Accept X Reject ___			3-12-97
	Output Coupling	Output shall be AC coupled	Accept X Reject ___			3-12-97
4.4.2	Gain vs. Freq. 150 MHz to 300 MHz	17.5dB Min., 18.5dB Max. -4°C to +40°C Attach x-y plot	Max 18.01 dB Min 17.82 dB Accept X Reject ___	Max 17.93 dB Min 17.78 dB Accept X Reject ___	Max 18.03 dB Min 17.82 dB Accept X Reject ___	3-12-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject ___ 0.19 dB	Accept X Reject ___ 0.15 dB	Accept X Reject ___ 0.21 dB	3-12-97
	Gain Temp. Sensitivity	$\pm$.22 dB from -4°C to +40°C Worse Case	Accept X Reject ___	Accept X Reject ___ 0.08 dB	Accept X Reject ___ 0.03 dB	3-12-97
4.4.3	Gain-Voltage Sensitivity Input Currents	$\leq$.5dB/v Worse Case $\pm$ .2dB for 7.6 to 8.4 Vdc 40ma MAX. 7.6v 8.0v 8.4v Attach X-Y Plot	0.02 dB 34.4 mA 35.0 mA 35.7 mA Accept X Reject ___	0.02 dB 31.4 mA 32.2 mA 32.7 mA Accept X Reject ___	0.02 dB 36.9 mA 37.7 mA 38.3 mA Accept X Reject ___	3-12-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1773 DATA SHEET
MODEL NUMBER VD622301
AEROJET P/N 1331579-9

S/N 109

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject ___			
		150 MHz	0.20 dB	0.40 dB	0.20 dB	
		225 MHz	0.30 dB	0.40 dB	0.25 dB	
		300 MHz	0.25 dB	0.35 dB	0.35 dB	3-12-97
4.4.8	Stability	Stable with the input terminated into a 2.5:1 mismatch and the output at all impedance's.	Accept X Reject ___			3-12-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 45 mA	Accept X Reject ___			
		Maximum Current	39.6 mA			3-13-97

NOTE: Review all recorded data and signify acceptance below.

Technician SHoffman T145 Date: 3-13-97

Quality Assurance [signature] Date: 3-17-97

CSI: ______ Date: ______

GSI: ______ Date: 3/12/97

Amplica, Inc.
Newbury Park, CA 91320

DRAWN	SIZE A	FSCM NO. 51025	ATP1773	REV

MODEL VD622301   107

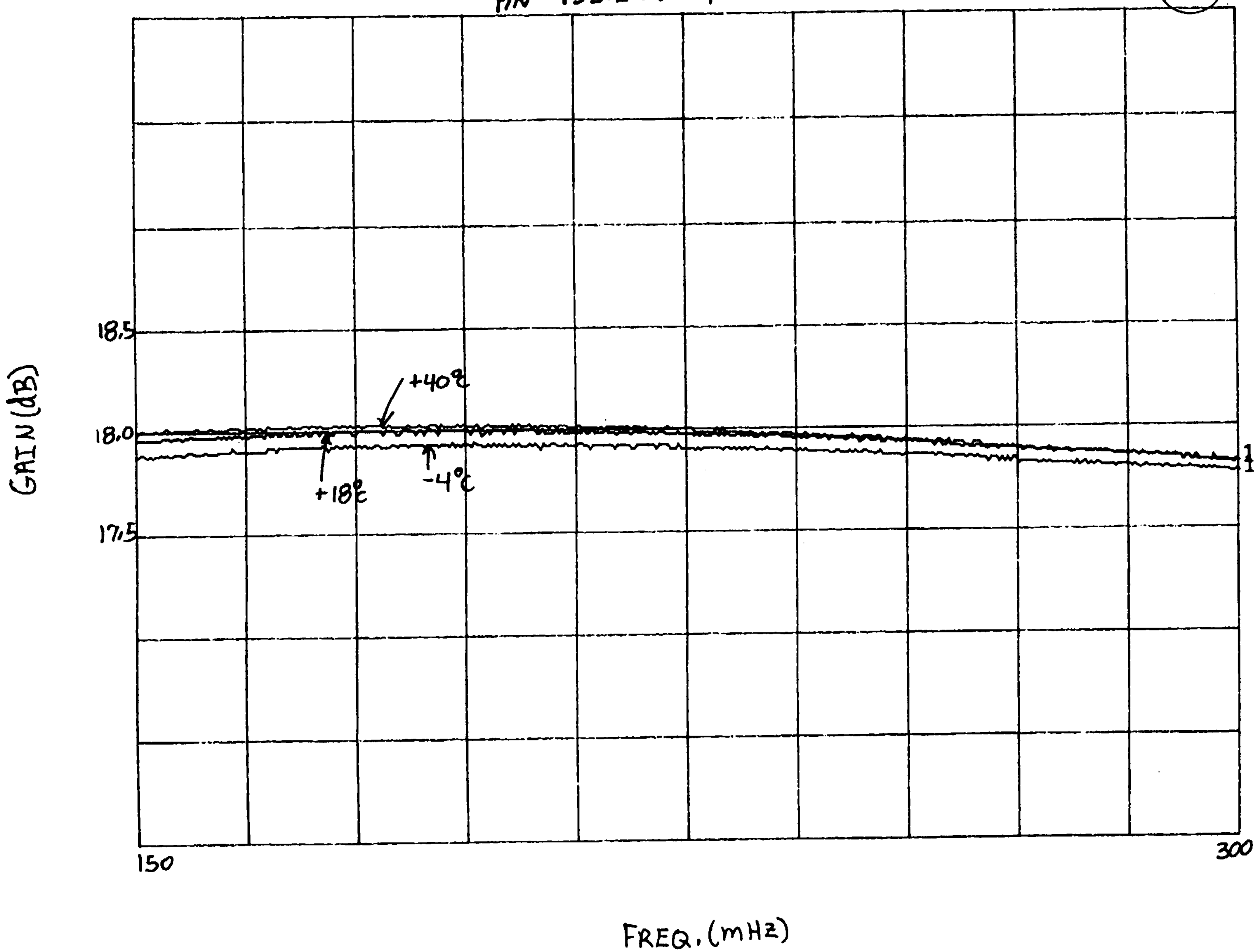
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SA T143 DATE 3-12-97

P/N 1331579-9



MODEL VDG22301 S/N 109

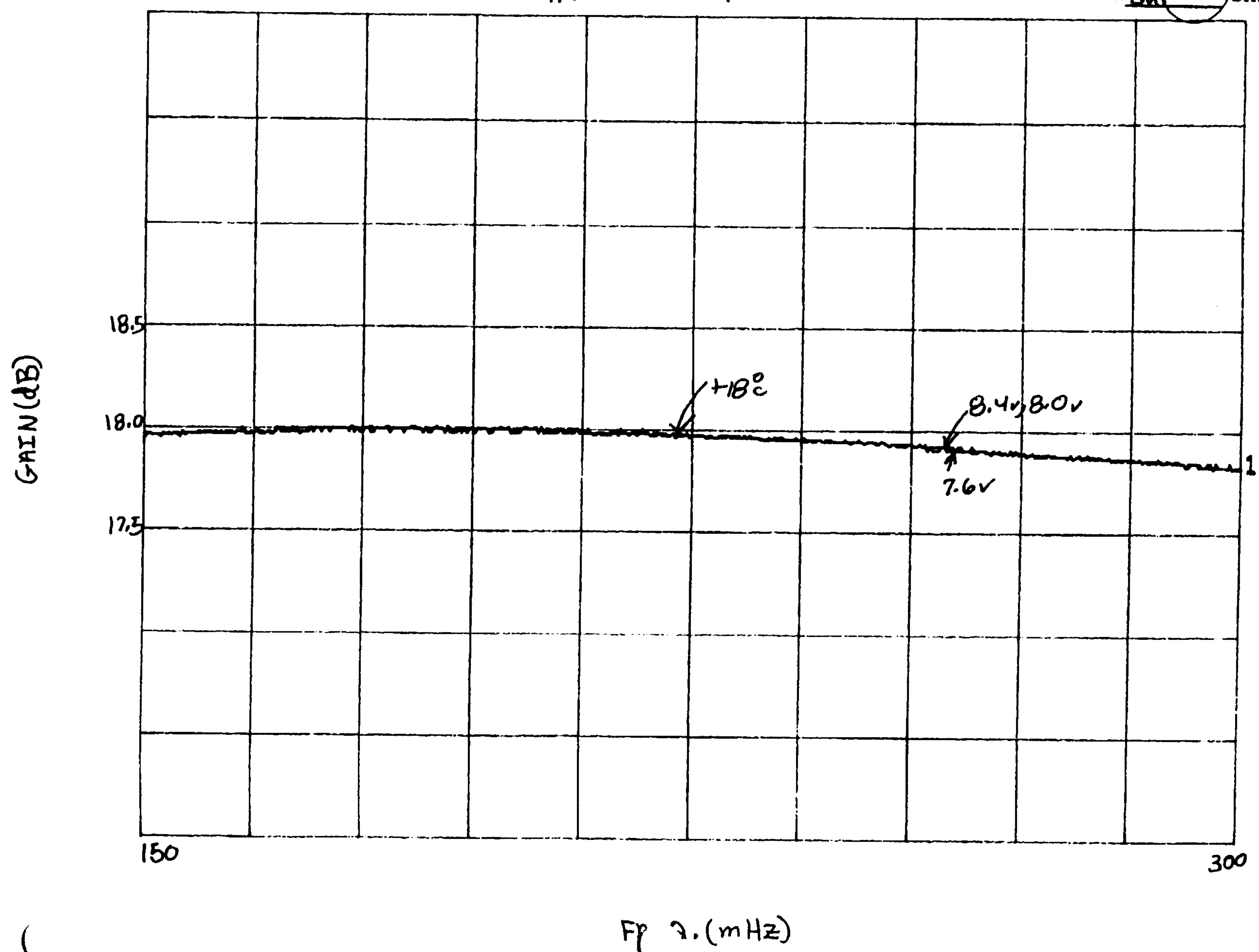
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SH T143 DATE 3-12-97

P/N 1331579-9



MODEL VD622301 /N 107

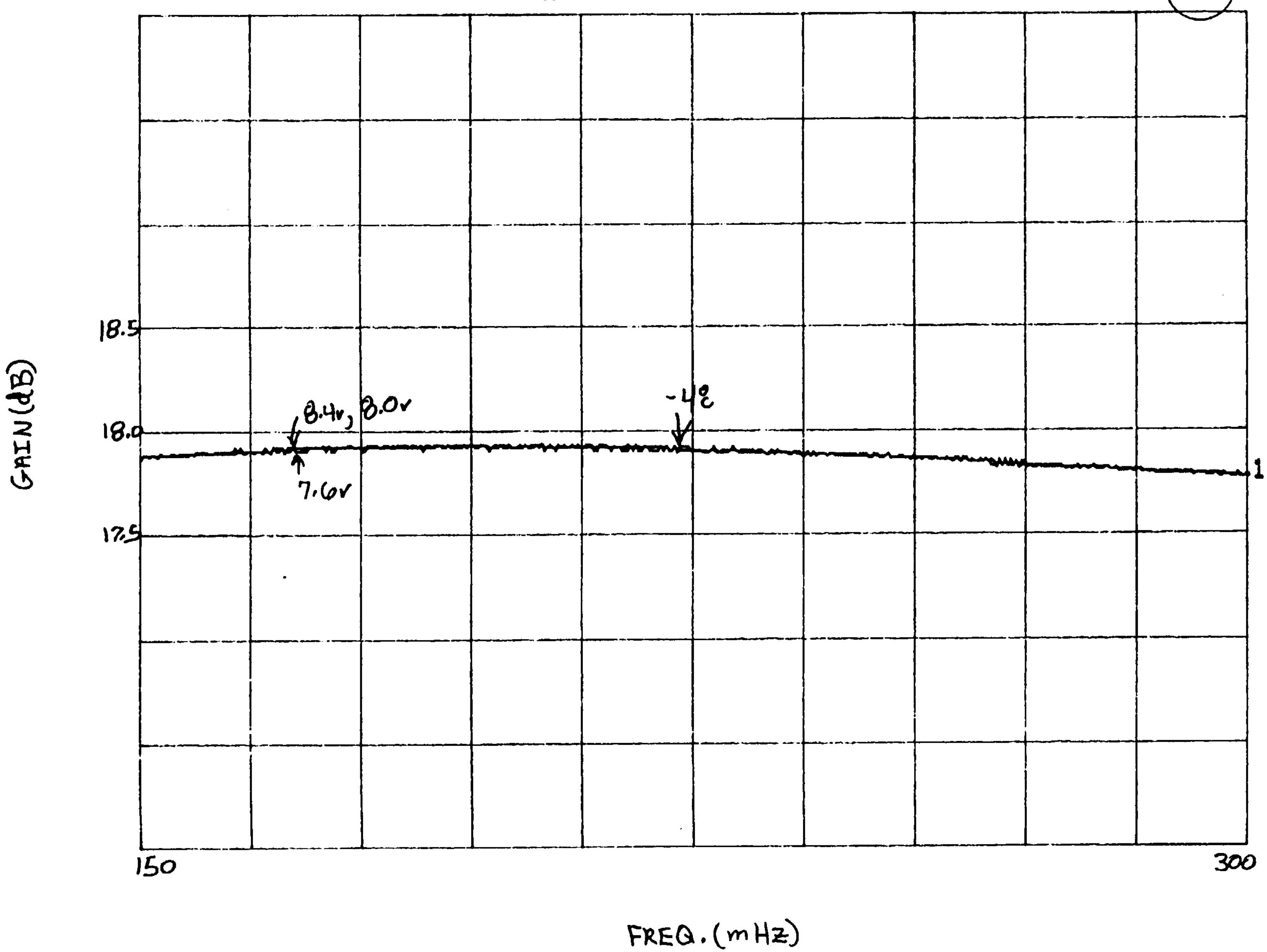
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SW T143 DATE 3-12-97

P/N 1331579-9



MODEL VD622301 S/N 109

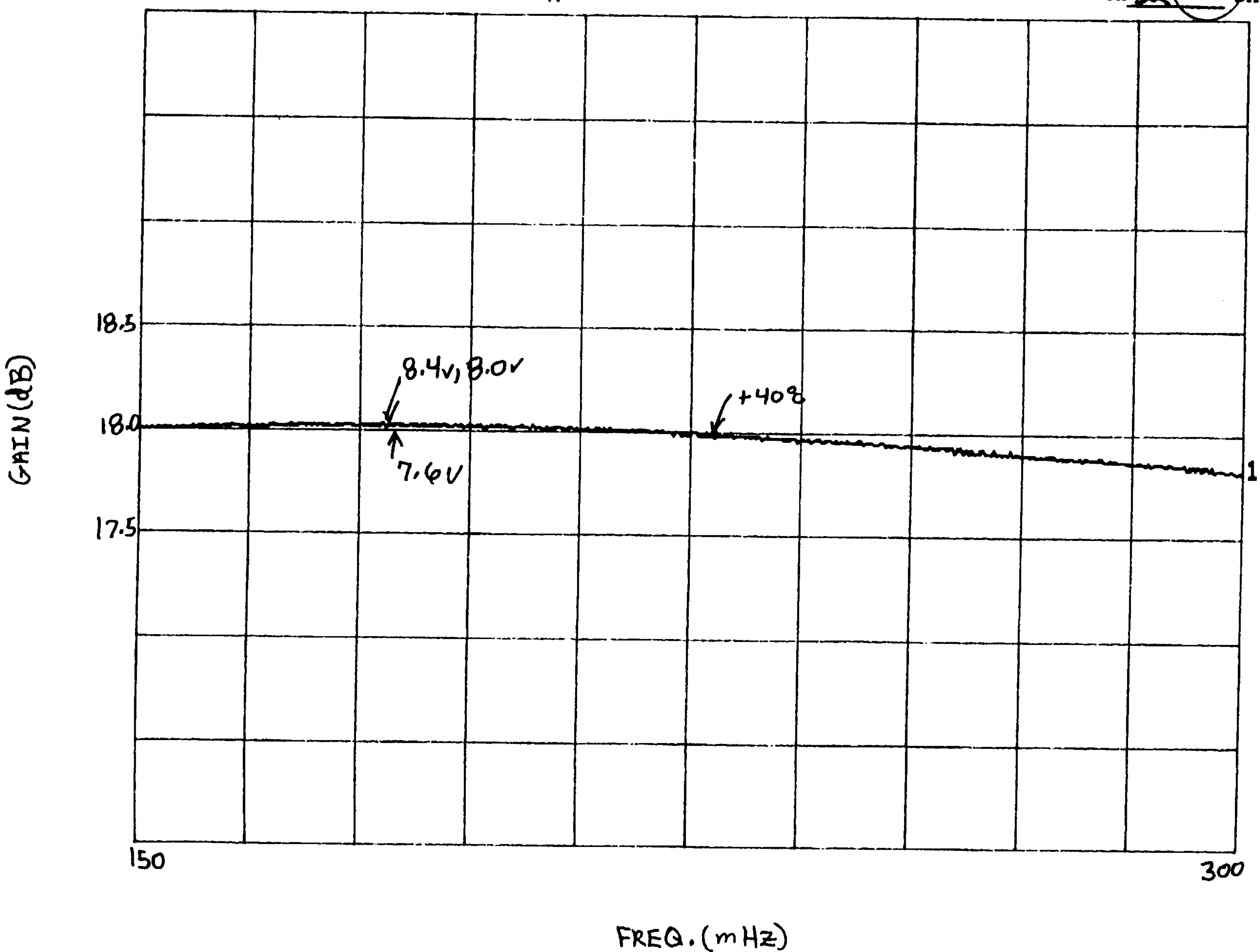
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SLA T143 DATE 3-12-97

P/N 1331579-9



Report No. 11491
June 1999

Channels 11-14 Amplifier

IF Amplifier (P/N:1331579-7, S/N: 106)

APPENDIX C
ATP1771 DATA SHEET
MODEL NUMBER UD122301
AEROJET P/N 1331579-7

S/N 106

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept ✓ Reject ___			12/4/96
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			N/A
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject ___			N/A
	Short Open Protection	No Damage	Accept X Reject ___			12-6-96
	Output Coupling	Output shall be AC coupled	Accept X Reject ___			12-6-96
4.4.2	Gain vs. Freq. 255 MHz to 390 MHz	14.5dB Min., 15.5dB Max. -4°C to +40°C Attach x-y plot	Max 15.21 dB Min 14.86 dB Accept X Reject ___	Max 15.15 dB Min 14.82 dB Accept X Reject ___	Max 15.20 dB Min 14.75 dB Accept X Reject ___	12-6-96
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject ___ 0.35 dB	Accept X Reject ___ 0.33 dB	Accept X Reject ___ 0.45 dB	12-6-96
	Gain Temp. Sensitivity	±.22 dB from -4°C to +40°C Worse Case	Accept X Reject ___	Accept X Reject ___ 0.06 dB	Accept X Reject ___ 0.12 dB	12-6-96
4.4.3	Gain-Voltage Sensitivity Input Currents	≤.5dB/v Worse Case ± .2dB for 7.6 to 8.4 Vdc 40ma MAX. 7.6v 8.0v 8.4v Attach X-Y Plot	0.01 dB 35.3 mA 35.9 mA 36.6 mA Accept X Reject ___	0.01 dB 31.0 mA 31.8 mA 32.3 mA Accept X Reject ___	0.01 dB 38.6 mA 39.3 mA 39.9 mA Accept X Reject ___	12-6-96

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1771 DATA SHEET
MODEL NUMBER UD122301
AEROJET P/N 1331579-7

S/N 106

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept ✓ Reject ___			
		255 MHz	.15 dB	.20 dB	.20 dB	
		322.5 MHz	.20 dB	.25 dB	.20 dB	12/5/96
		390 MHz	.20 dB	.25 dB	.30 dB	
4.4.8	Stability	Stable with the input terminated into a 2.5:1 mismatch and the output at all impedance's.	Accept X Reject ___			12-6-96
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 45 mA	Accept X Reject ___			
		Maximum Current	42.5 mA			12-6-96

NOTE: Review all recorded data and signify acceptance below.

Technician S Hoffman T143 Date: 12-6-96

Quality Assurance [signature] Date: 12-9-96

CSI: Date:

GSI: Date: 2/10/97

Amplica, Inc.
Newbury Park, CA 91320

DRAWN	SIZE A	FSCM NO. 51025	ATP1771	REV. B
ISSUED	SCALE		SHEET 37 OF 39	

FORM 153

MODEL VD122301 S/N 106

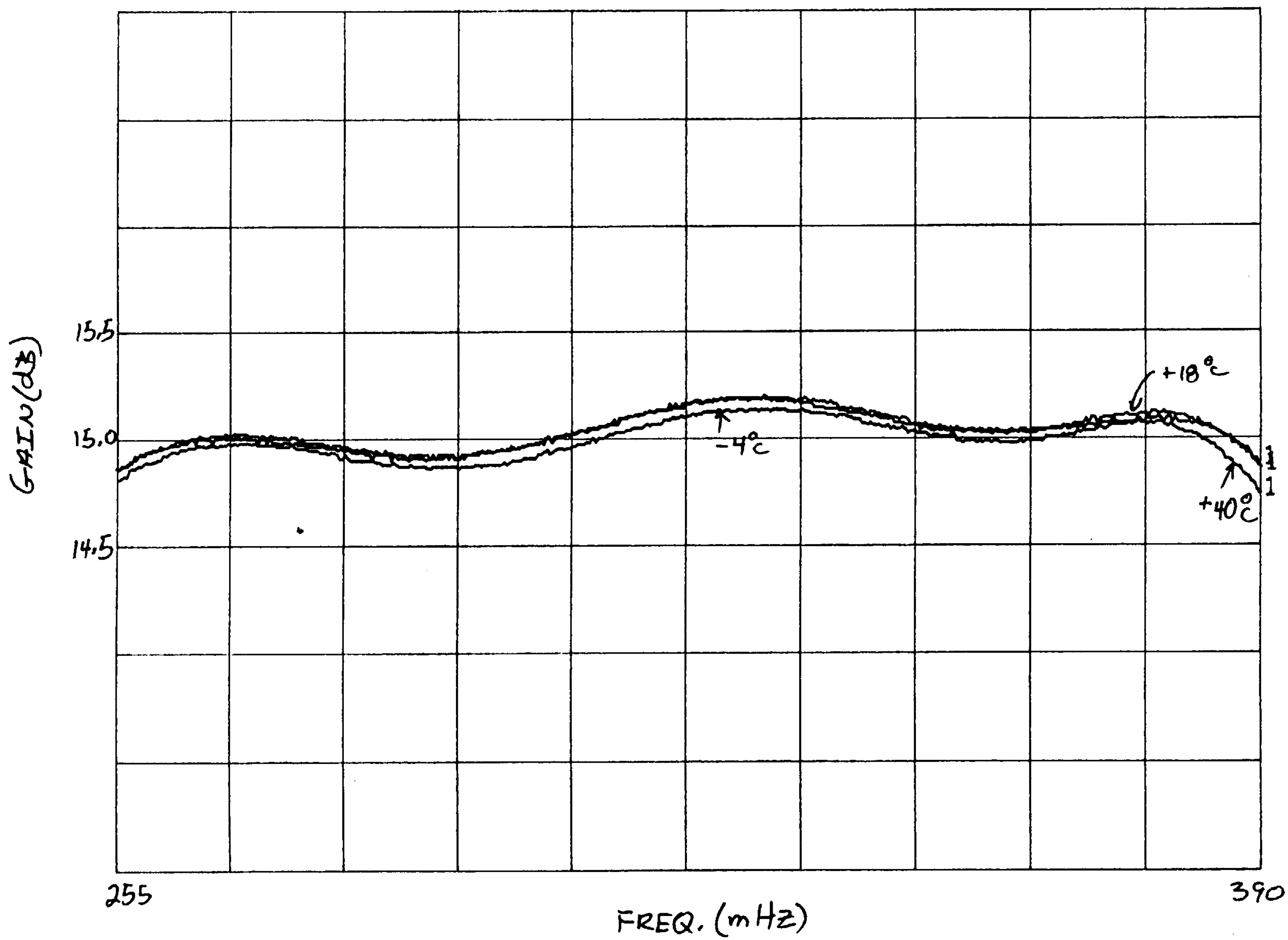
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE AS NOTED DEG.C.

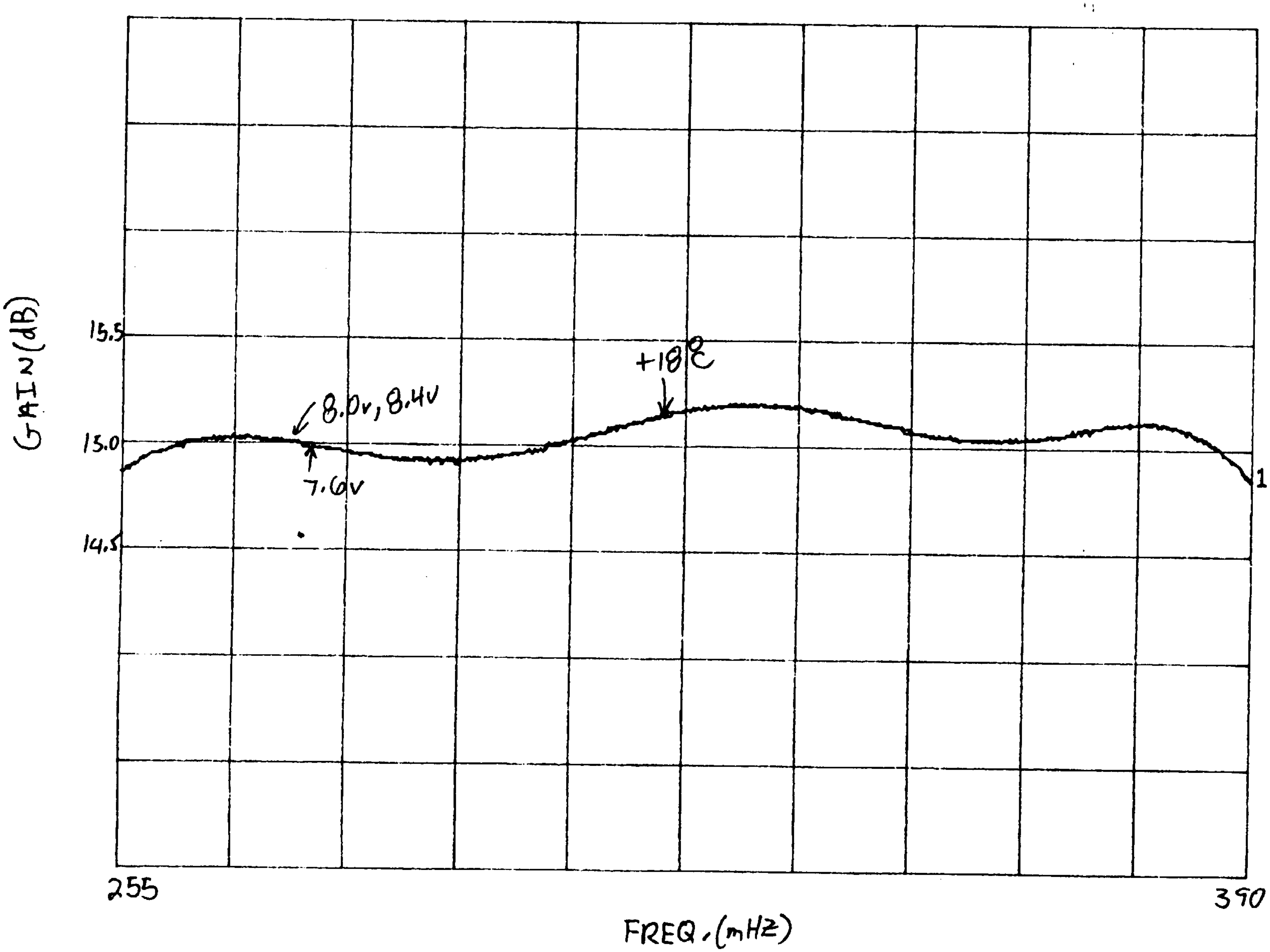
TECH SG T143 DATE 12-6-96

P/N 1331579 - 7



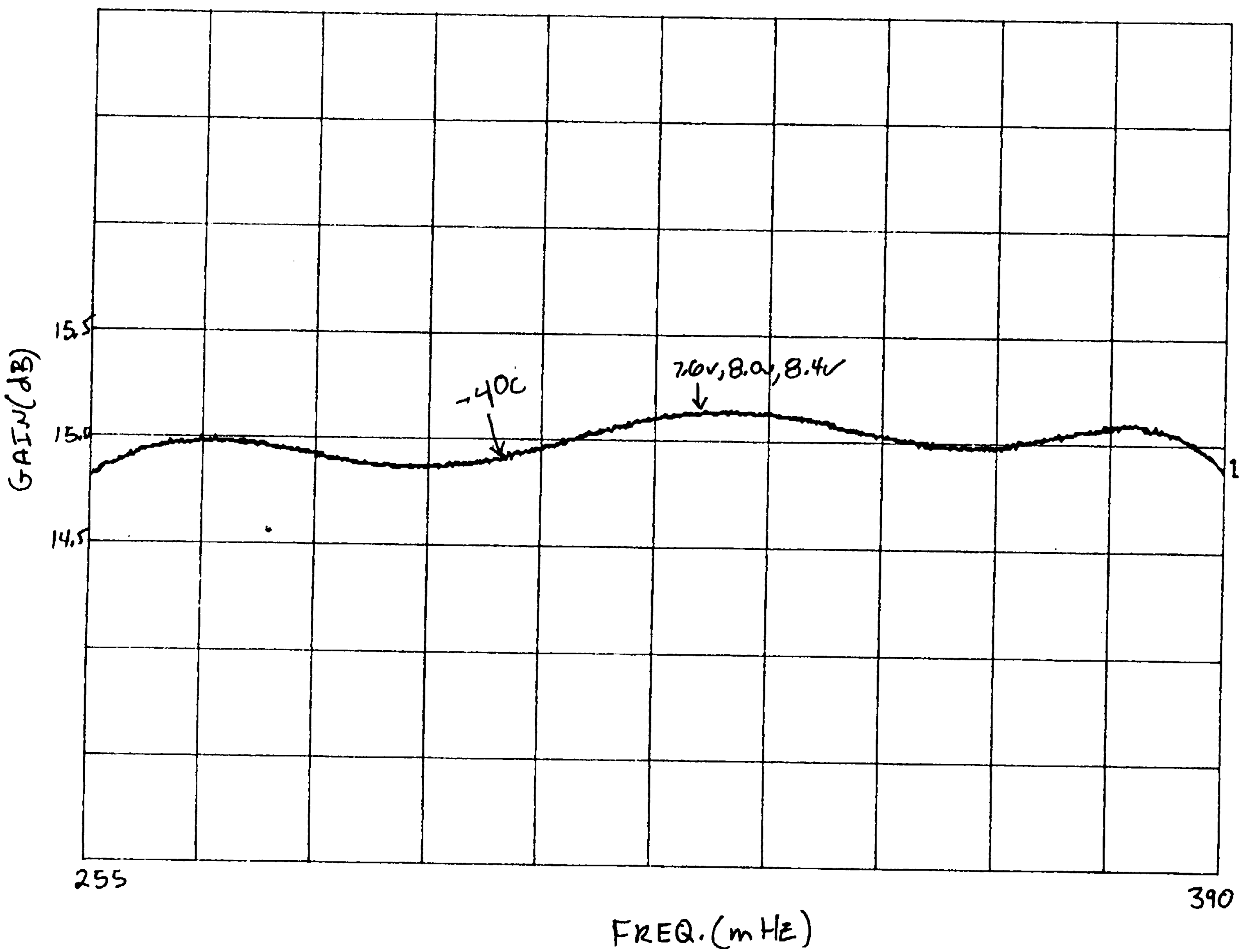
GAIN-VOLTAGE SENSITIVITY VS. FREQ.
VERTICAL CALIBRATION 0.5 dB INCH
TEMPERATURE as noted DEG.C.
TECH SH (1143) DATE 12-6-96

P/N 1331579-7



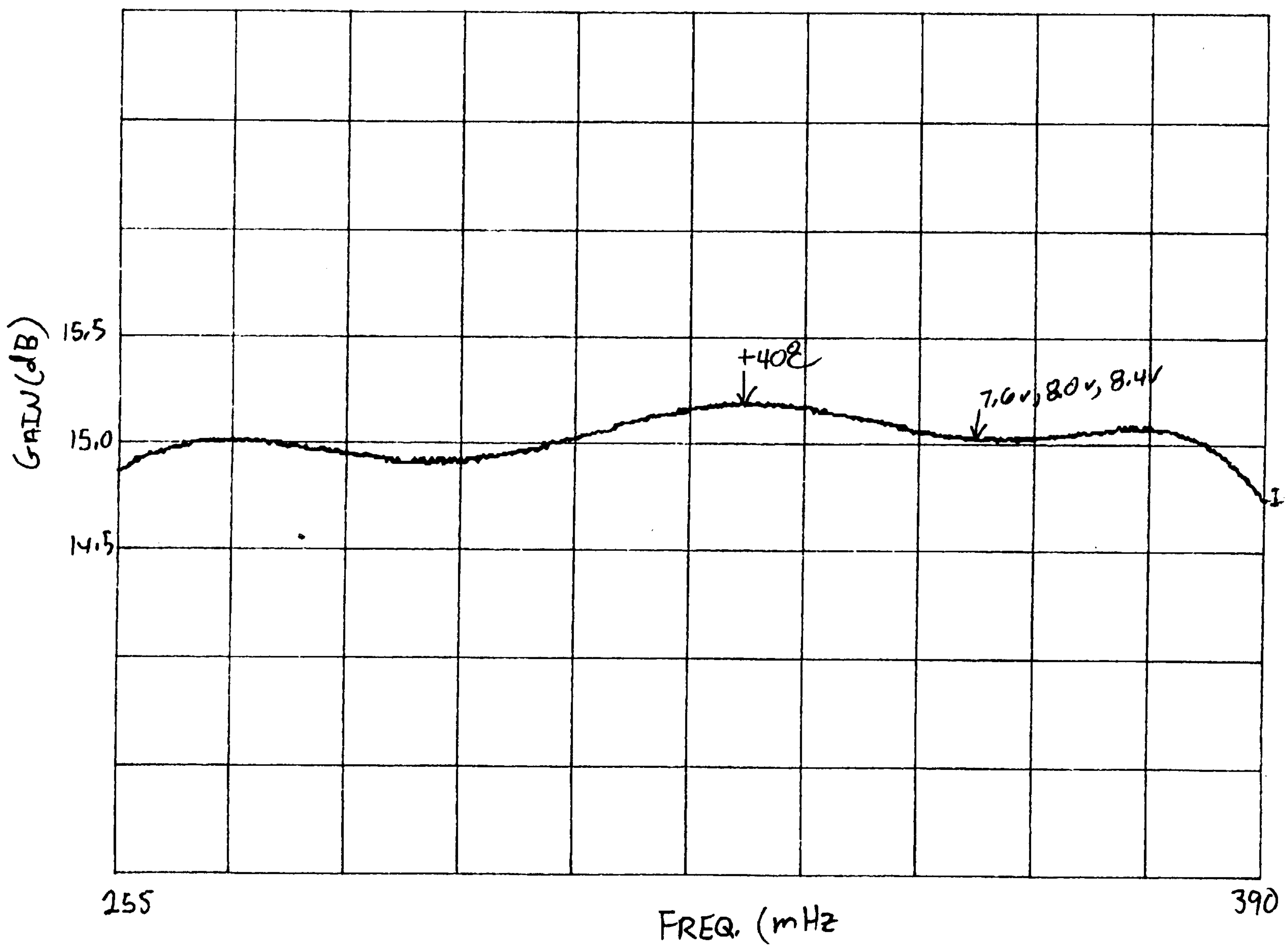
MODEL UD122-301 S/N 106
GAIN-VOLTAGE SENSITIVITY VS. FREQ.
VERTICAL CALIBRATION 0.5 dB INCH
TEMPERATURE as noted DEG.C.
TECH SW (114) DATE 12-6-96

P/N 1331579-7



GAIN-VOLTAGE SENSITIVITY VS. FREQ.
VERTICAL CALIBRATION 0.5 dB INCH
TEMPERATURE as noted DEG.C.
TECH SW T143 DATE 12-6-96

P/N 1331579-7



Report No. 11491
June 1999

Channel 11 Amplifier

IF Amplifier (P/N:1331579-10, S/N: 110)

APPENDIX C
ATP1774 DATA SHEET
MODEL NUMBER UD114302
AEROJET P/N 1331579-10

S/N 110

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject ___			4-17-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			4-17-97
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject ___			4-17-97
	Short Open Protection	No Damage	Accept X Reject ___			4-17-97
	Output Coupling	Output shall be AC coupled	Accept X Reject ___			4-17-97
4.4.2	Gain vs. Freq. 255 MHz to 390 MHz	38.5dB Min., 39.5dB Max. -4°C to +40°C Attach x-y plot	Max 39.34 dB Min 38.96 dB Accept X Reject ___	Max 39.48 dB Min 39.09 dB Accept X Reject ___	Max 39.06 dB Min 38.64 dB Accept X Reject ___	4-17-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject ___ 0.38 dB	Accept X Reject ___ 0.39 dB	Accept X Reject ___ 0.41 dB	4-17-97
	Gain Temp. Sensitivity	±.44 dB from -4°C to +40°C Worse Case	Accept X Reject ___	Accept X Reject ___ 0.18 dB	Accept X Reject ___ 0.32 dB	4-17-97
4.4.3	Gain-Voltage Sensitivity Input Currents	≤.5dB/v Worse Case ± .2dB for 7.6 to 8.4 Vdc 45ma MAX. 7.6v 8.0v 8.4v Attach X-Y Plot	0.03 dB 37.9 mA 38.6 mA 39.2 mA Accept X Reject ___	0.03 dB 36.8 mA 37.5 mA 38.1 mA Accept X Reject ___	0.03 dB 38.9 mA 39.5 mA 40.2 mA Accept X Reject ___	4-17-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1774 DATA SHEET
MODEL NUMBER UD114302
AEROJET P/N 1331579-10

S/N 110

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept ✓ Reject ___			
		255 MHz	0.60 dB	0.80 dB	0.60 dB	
		322.5 MHz	0.55 dB	0.60 dB	0.50 dB	
		390 MHz	0.75 dB	0.85 dB	0.70 dB	4-17-97
4.4.8	Stability	Unconditionally Stable	Accept X Reject ___			4-17-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 50 mA	Accept ✓ Reject ___			
		Maximum Current	40.8 mA			4-17-97

NOTE: Review all recorded data and signify acceptance below.

Technician: [signature] T143 Date: 4-17-97

Quality Assurance: [signature] Date: 4-21-97

CSI: [signature] Date: 4-22-97

GSI: Date: 4/17/97

MODEL OD114302 /N 110

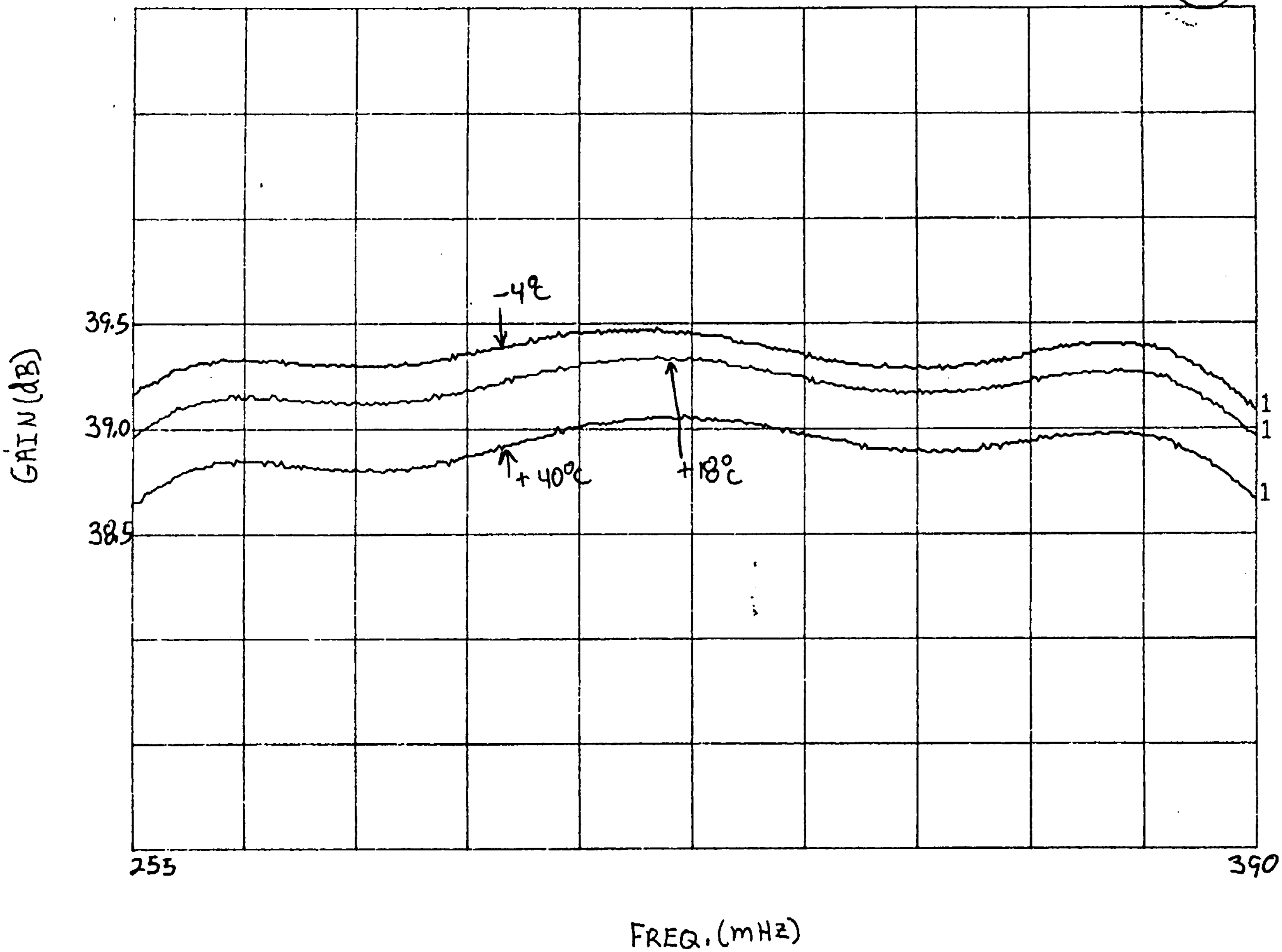
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE As NOTED DEG.C.

TECH SH T143 DATE 4-17-97

P/N 1331579-10



MODEL UD114302 S/N 110

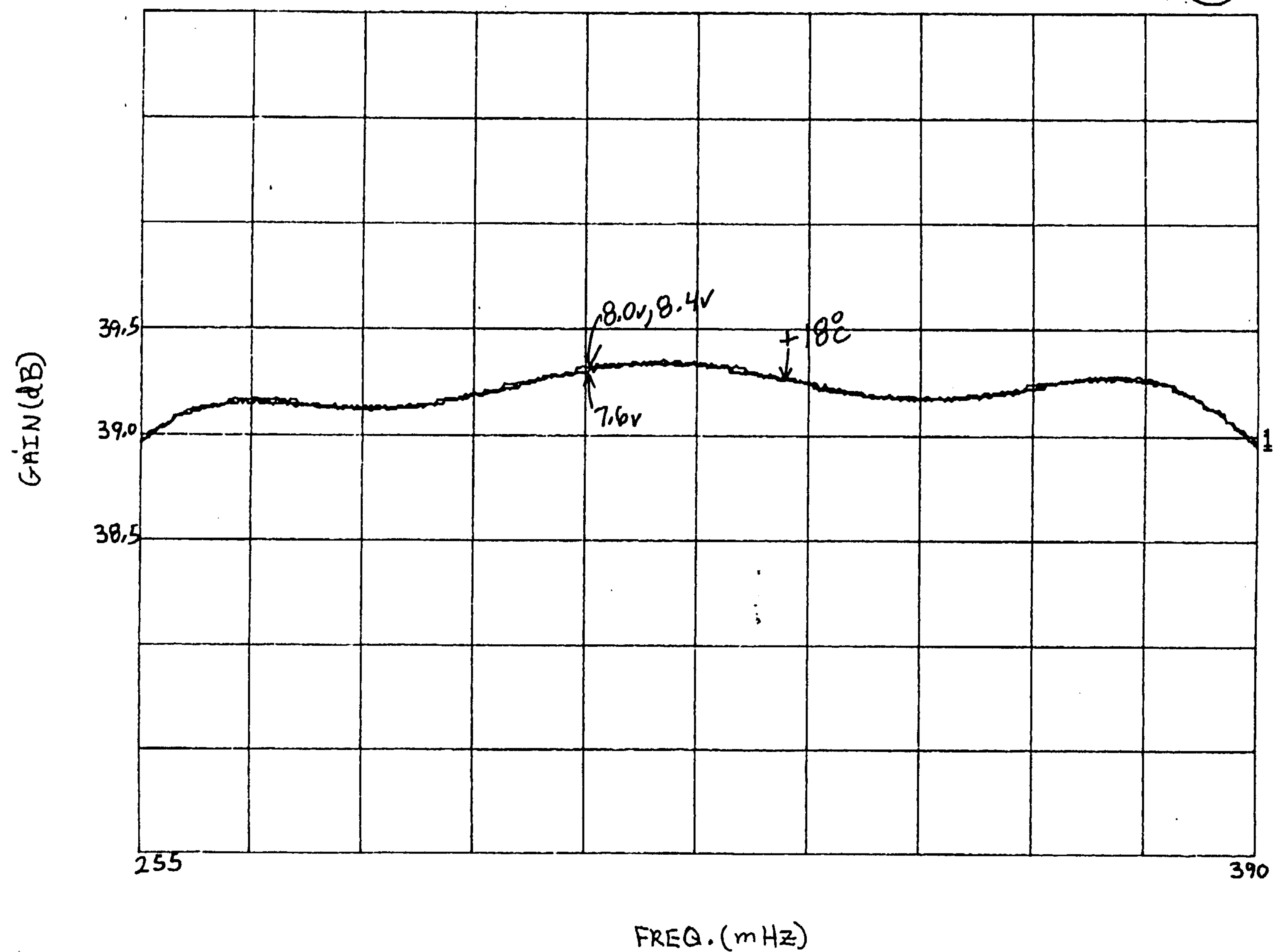
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5 dB INCH

TEMPERATURE AS NOTED DEG.C.

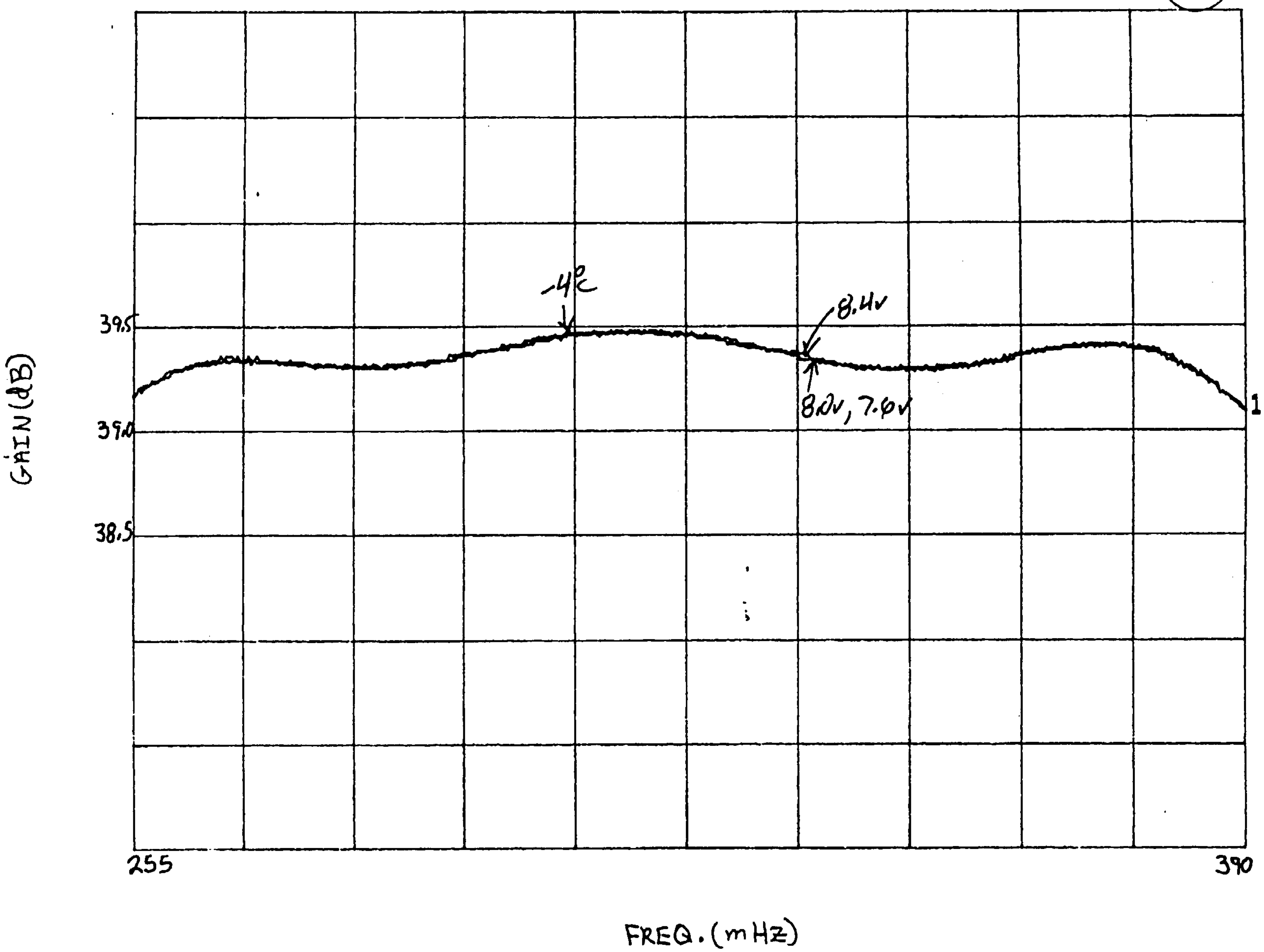
TECH ~~SW~~ T143 DATE 4-17-97

P/N 1331579-10



MODEL UD114302 S/N 110
GAIN-VOLTAGE SENSITIVITY VS. FREQ.
VERTICAL CALIBRATION 0.5dB INCH
TEMPERATURE AS NOTED DEG.C.
TECH SW T143 DATE 4-17-97

P/N 1331579-10



MODEL UD114302 S/N 110

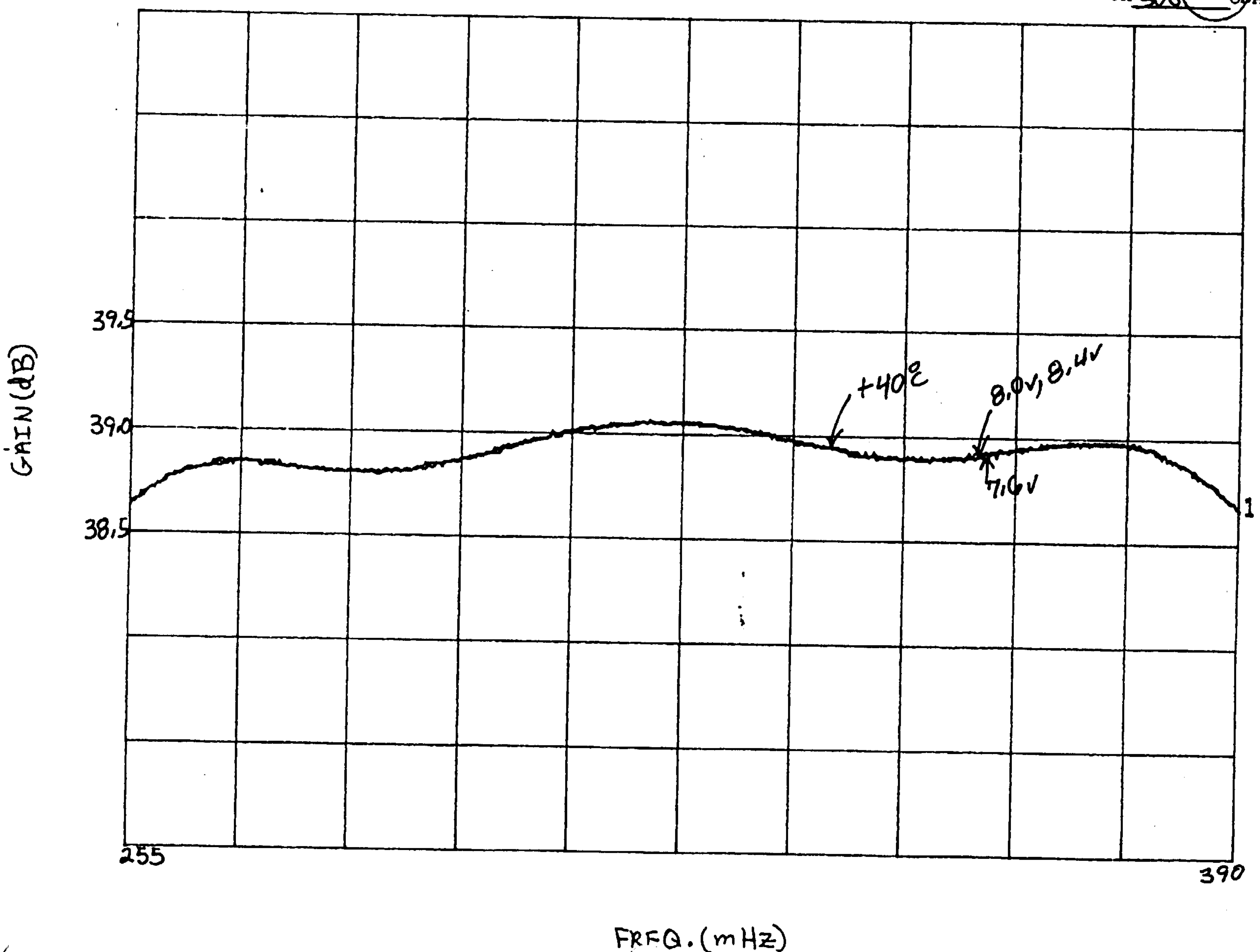
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5 dB INCH

TEMPERATURE as NOTED DEG.C.

TECH GAO T143 DATE 4-17-97

P/N 1331579-10



Report No. 11491
June 1999

Channel 12 Amplifier

IF Amplifier (P/N:1331579-11, S/N: 109)

APPENDIX C
ATP1775 DATA SHEET
MODEL NUMBER UD415301
AEROJET P/N 1331579-11

S/N 109

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject			3-12-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			3-12-97
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject			3-12-97
	Short Open Protection	No Damage	Accept X Reject			3-12-97
	Output Coupling	Output shall be AC coupled	Accept X Reject			3-12-97
4.4.2	Gain vs. Freq. 290 MHz to 355 MHz	42.5dB Min., 43.5dB Max. -4°C to +40°C Attach x-y plot	Max 43.23 dB Min 42.97 dB Accept X Reject	Max 43.25 dB Min 42.99 dB Accept X Reject	Max 43.03 dB Min 42.77 dB Accept X Reject	3-12-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0.26 dB	Accept X Reject 0.26 dB	Accept X Reject 0.26 dB	3-12-97
	Gain Temp. Sensitivity	±.44 dB from -4°C to +40°C Worse Case	Accept X Reject	Accept X Reject 0.05 dB	Accept X Reject 0.20 dB	3-12-97
4.4.3	Gain-Voltage Sensitivity Input Currents	≤.5dB/v Worse Case ± .2dB for 7.6v 7.6 to 8.4 Vdc 8.0v 50ma MAX. 8.4v Attach X-Y Plot	0.03 dB 41.6 mA 42.3 mA 42.9 mA Accept X Reject	0.03 dB 40.3 mA 41.0 mA 41.6 mA Accept X Reject	0.02 dB 42.7 mA 43.4 mA 44.0 mA Accept X Reject	3-12-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1775 DATA SHEET
MODEL NUMBER UD415301
AEROJET P/N 1331579-11

S/N 109

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject			
		290 MHz 322.5 MHz 355 MHz	0.40 dB 0.40 dB 0.55 dB	0.45 dB 0.50 dB 0.60 dB	0.40 dB 0.40 dB 0.50 dB	3-12-97
4.4.8	Stability	Unconditionally Stable	Accept X Reject			3-12-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 55 mA	Accept X Reject			
		Maximum Current	44.3 mA			3-13-97

NOTE: Review all recorded data and signify acceptance below.

Technician SHoffman (T145) Date: 3-13-97

Quality Assurance Irene Luna Date: 3-17-97

CSI: Date:

GSI: Date: 3/13/97

Amplica, Inc.
Newbury Park, CA 91320

DRAWN	SIZE A	FSCM NO. 51025	ATP1775	REV.
ISSUED	SCALE		SHEET 37 OF 39	

MODEL UD415301 S/N 109

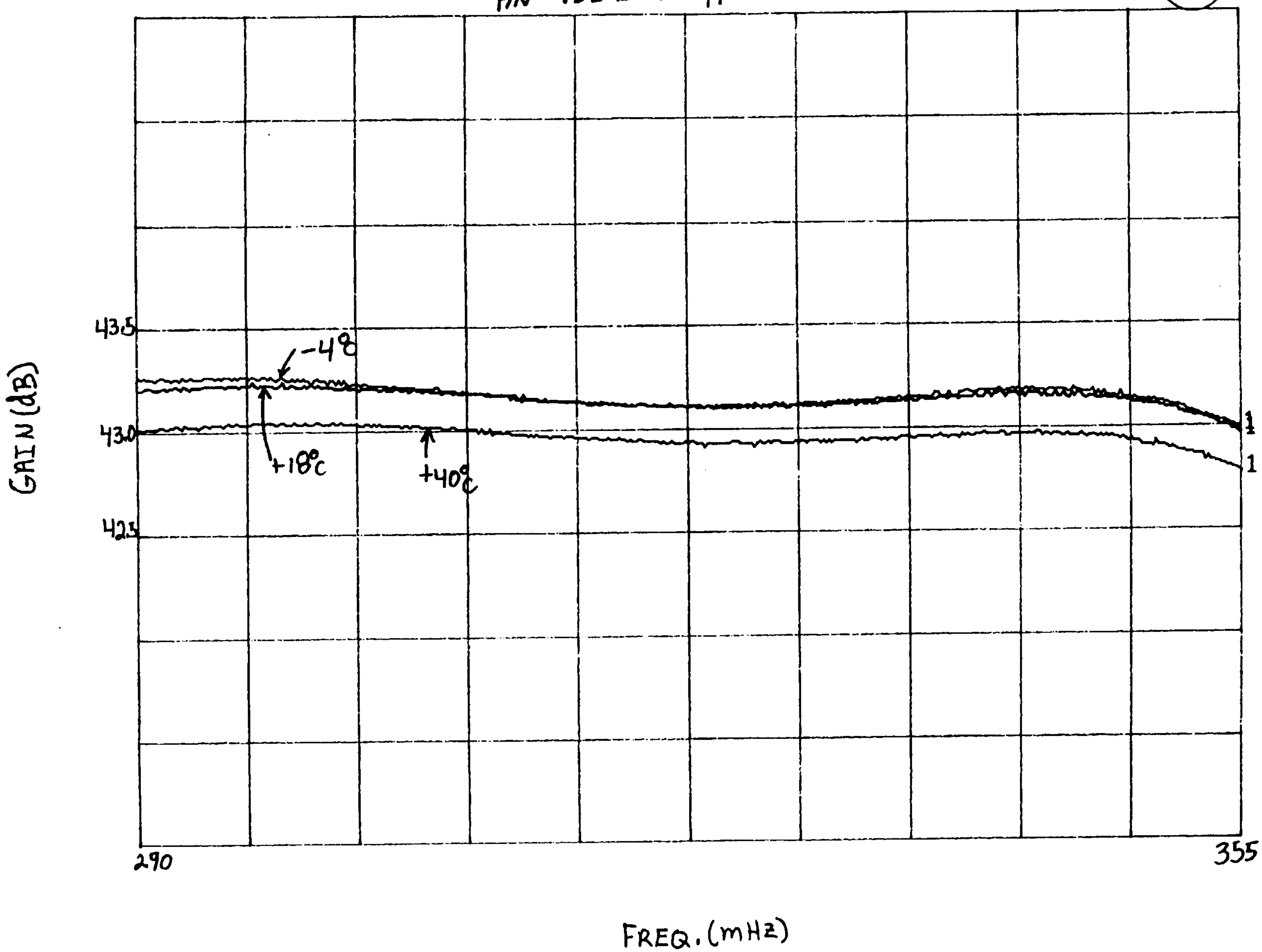
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SW T143 DATE 3-12-97

P/N 1331579-11



MODEL UD415301 S/N 109

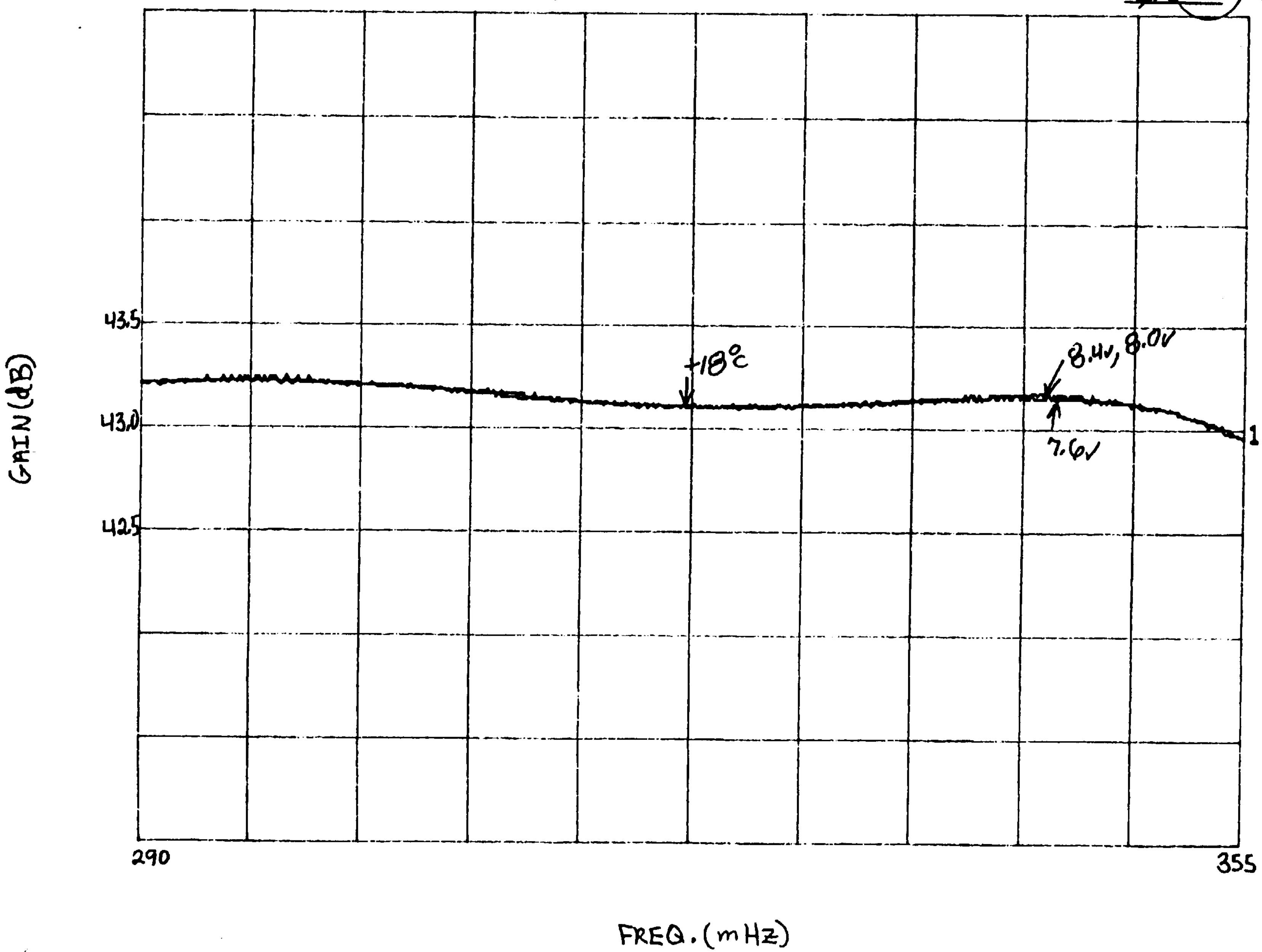
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SA T143 DATE 3-12-97

P/N 1331579-11



MODEL UD415301 S/N 109

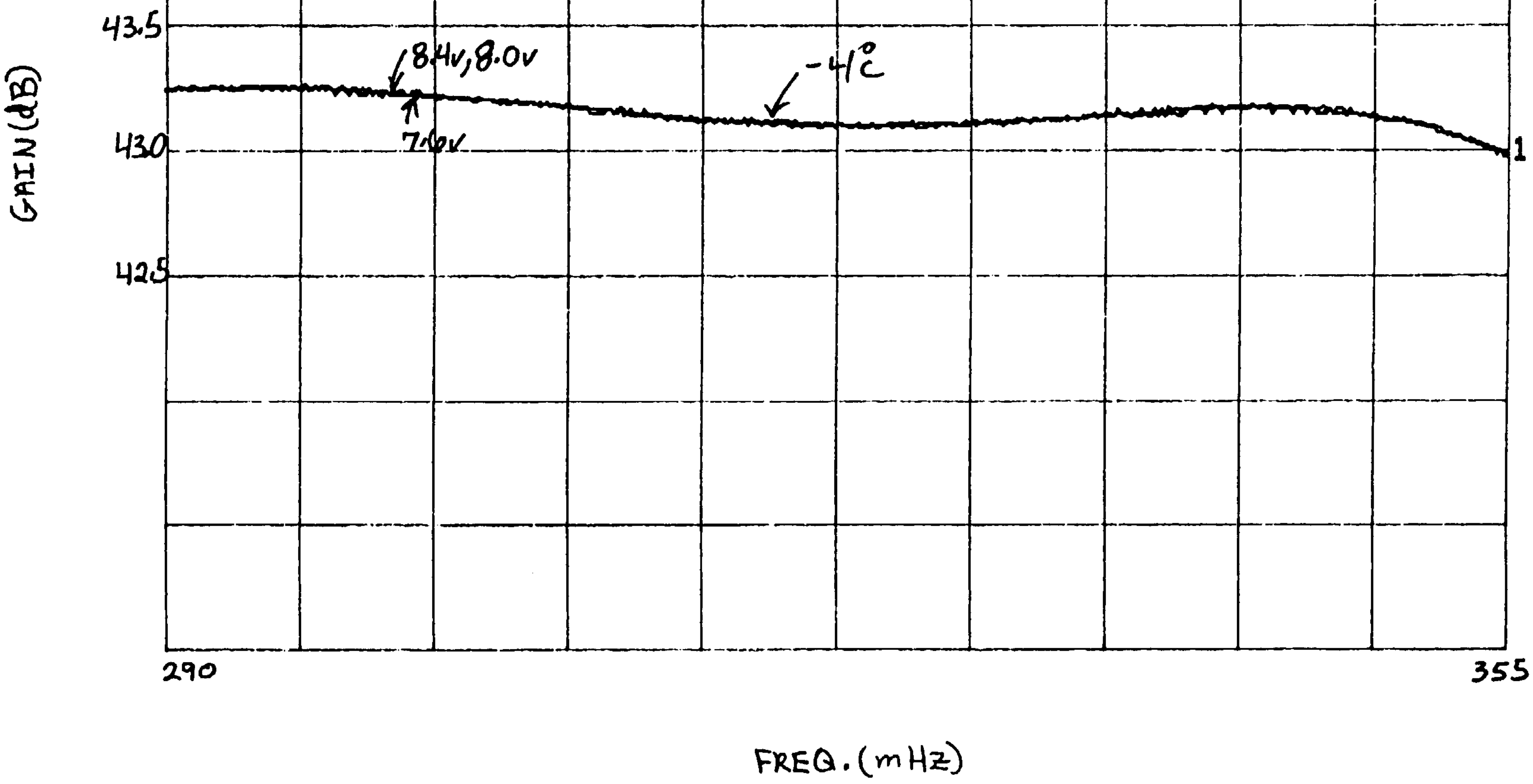
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SW T143 DATE 3-12-97

P/N 1331579-11



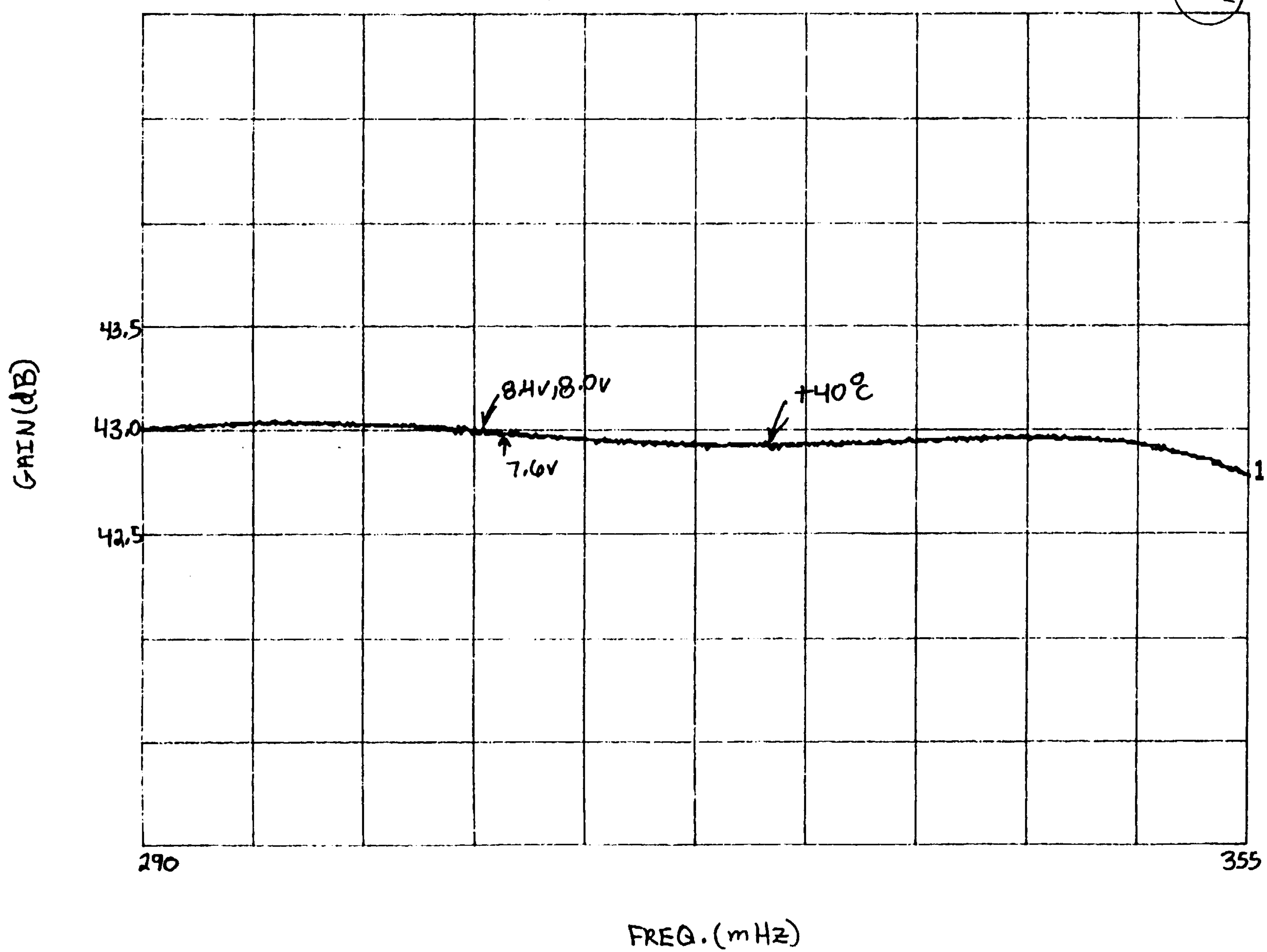
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH GA (1143) DATE 3-12-97

P/N 1331579-11



Report No. 11491
June 1999

Channel 13 Amplifier

IF Amplifier (P/N:1331579-12, S/N: 110)

APPENDIX C
ATP1776 DATA SHEET
MODEL NUMBER UD315301
AEROJET P/N 1331579-12

S/N 110

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject ___			4-17-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			4-17-97
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject ___			4-17-97
	Short Open Protection	No Damage	Accept X Reject ___			4-17-97
	Output Coupling	Output shall be AC coupled	Accept X Reject ___			4-17-97
4.4.2	Gain vs. Freq. 305 MHz to 340 MHz	44.5dB Min., 45.5dB Max. -4°C to +40°C Attach x-y plot	Max 45.24 dB Min 44.97 dB Accept X Reject ___	Max 45.07 dB Min 44.82 dB Accept X Reject ___	Max 45.20 dB Min 44.91 dB Accept X Reject ___	4-17-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept ✓ Reject ___ 0.27 dB	Accept ✓ Reject ___ 0.25 dB	Accept X Reject ___ 0.29 dB	4-17-97
	Gain Temp. Sensitivity	±.44 dB from -4°C to +40°C Worse Case	Accept X Reject ___	Accept ✓ Reject ___ 0.21 dB	Accept X Reject ___ 0.08 dB	4-17-97
4.4.3	Gain-Voltage Sensitivity Input Currents	≤.5dB/v Worse Case ± .2dB for 7.6 to 8.4 Vdc 50ma MAX. 7.6v 8.0v 8.4v Attach X-Y Plot	0.04 dB 41.4 mA 42.1 mA 42.7 mA Accept X Reject ___	0.04 dB 40.4 mA 41.1 mA 41.7 mA Accept X Reject ___	0.04 dB 42.5 mA 43.2 mA 43.8 mA Accept X Reject ___	4-17-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

Amplica, Inc.
Newbury Park, CA 91320

DRAWN	SIZE A	FSCM NO. 51025	ATP1776	REV.
ISSUED	SCALE		SHEET 35 OF 39	

APPENDIX C
ATP1776 DATA SHEET
MODEL NUMBER UD315301
AEROJET P/N 1331579-12

S/N 110

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject ___			
		305 MHz	0.40 dB	0.45 dB	0.40 dB	
		322.5 MHz	0.40 dB	0.45 dB	0.40 dB	
		340 MHz	0.45 dB	0.45 dB	0.45 dB	4-17-97
4.4.8	Stability	Unconditionally Stable	Accept X Reject ___			4-17-~~95~~ 97 SH
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 55 mA	Accept X Reject ___			
		Maximum Current	44.5 mA			4-17-~~95~~ 97 SH

NOTE: Review all recorded data and signify acceptance below.

Technician S Hoffm T143 Date: 4-17-97

Quality Assurance Steve Fiero Date: 4-21-97

CSI: [signature] QC 176 Date: 4-22-97

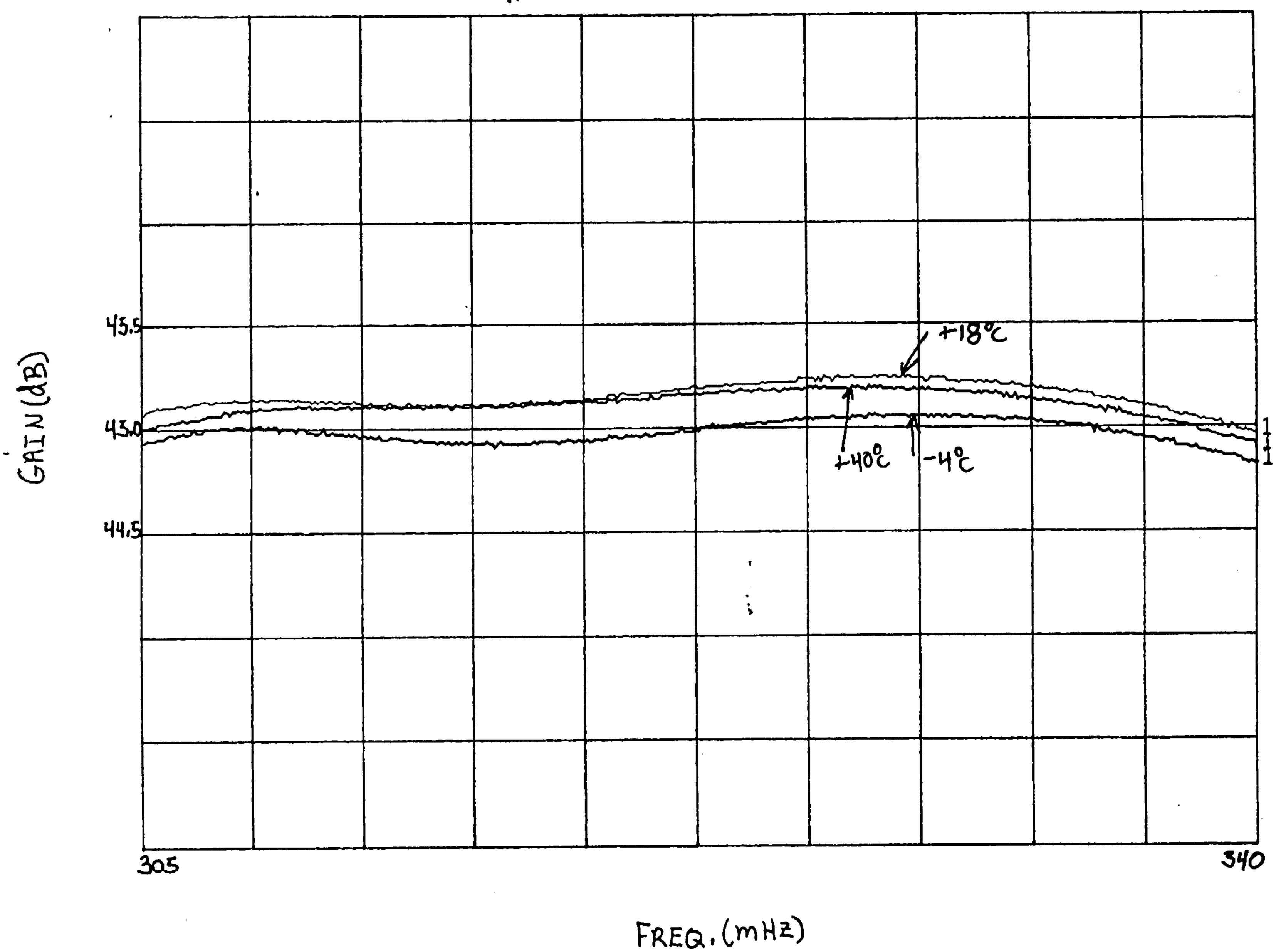
GSI: Date: 4/17/97

Amplica, Inc. Newbury Park, CA 91320	SIZE	FSCM NO.		REV.
DRAWN	A	51025	ATP1776	
ISSUED	SCALE		SHEET 37 OF 39	

MODEL UD315301 S/N 110
GAIN VS FREQUENCY
VERTICAL CALIBRATION .5 dB INCH
TEMPERATURE AS NOTED DEG.C
TECH SH DATE 4-17-97

T143

P/N 1331579 - 12



MODEL UD315301 S/N 110

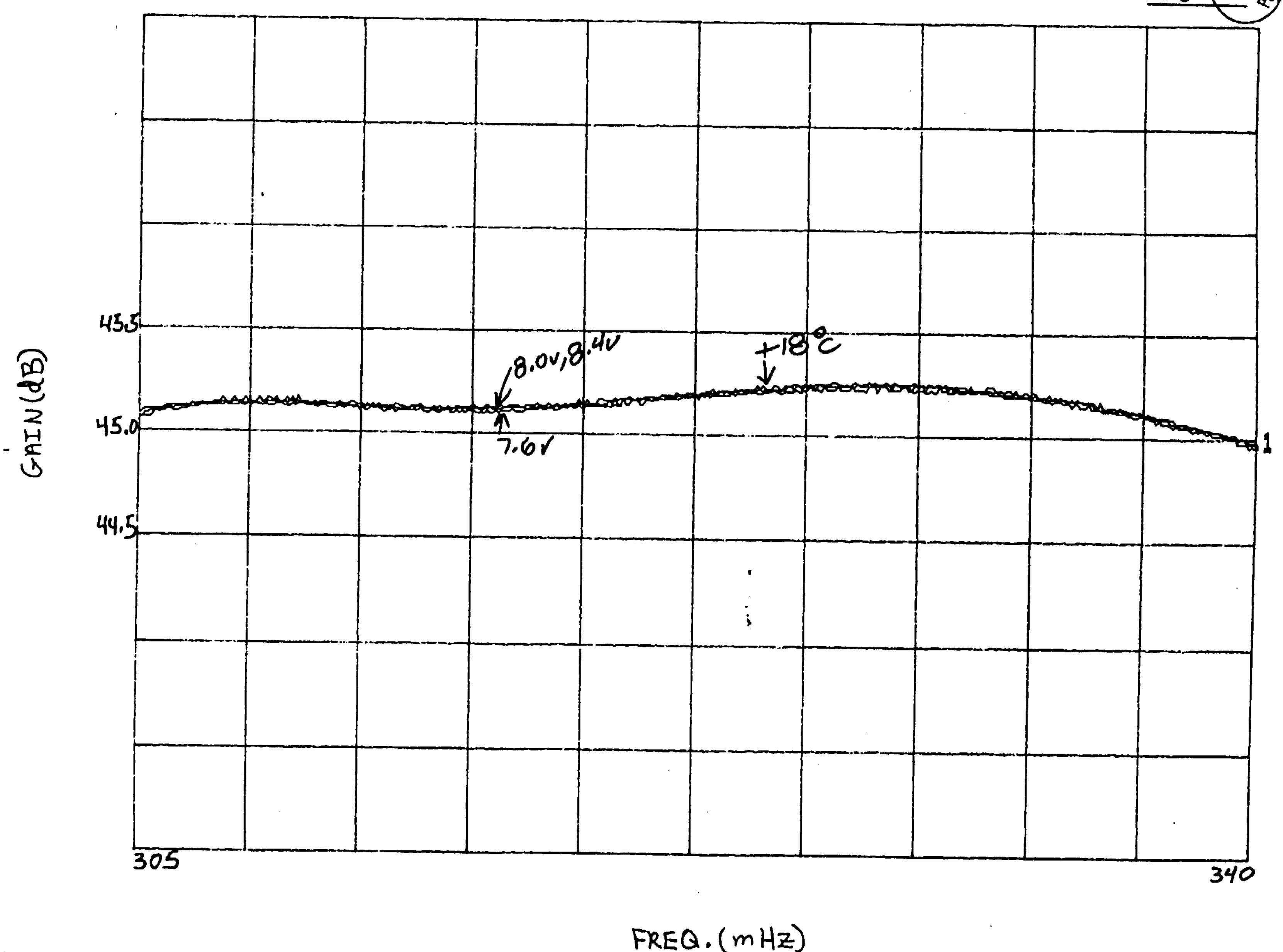
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH 36 43 DATE 4-17-97

P/N 1331579-12



MODEL UD315301 S/N 110

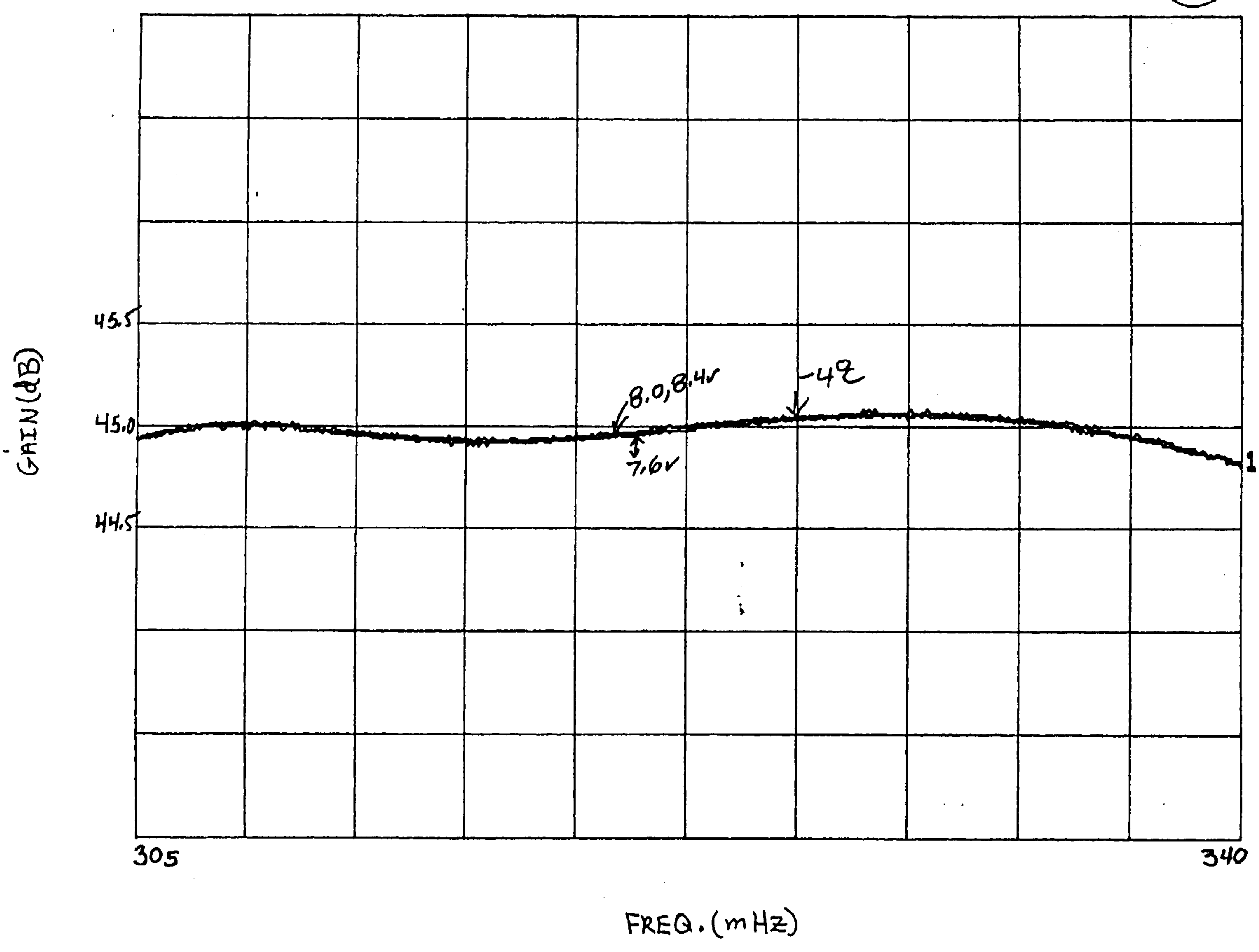
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SUS T1.43 DATE 4-17-97

P/N 1331579-12



MODEL UD 315301 S/N 110

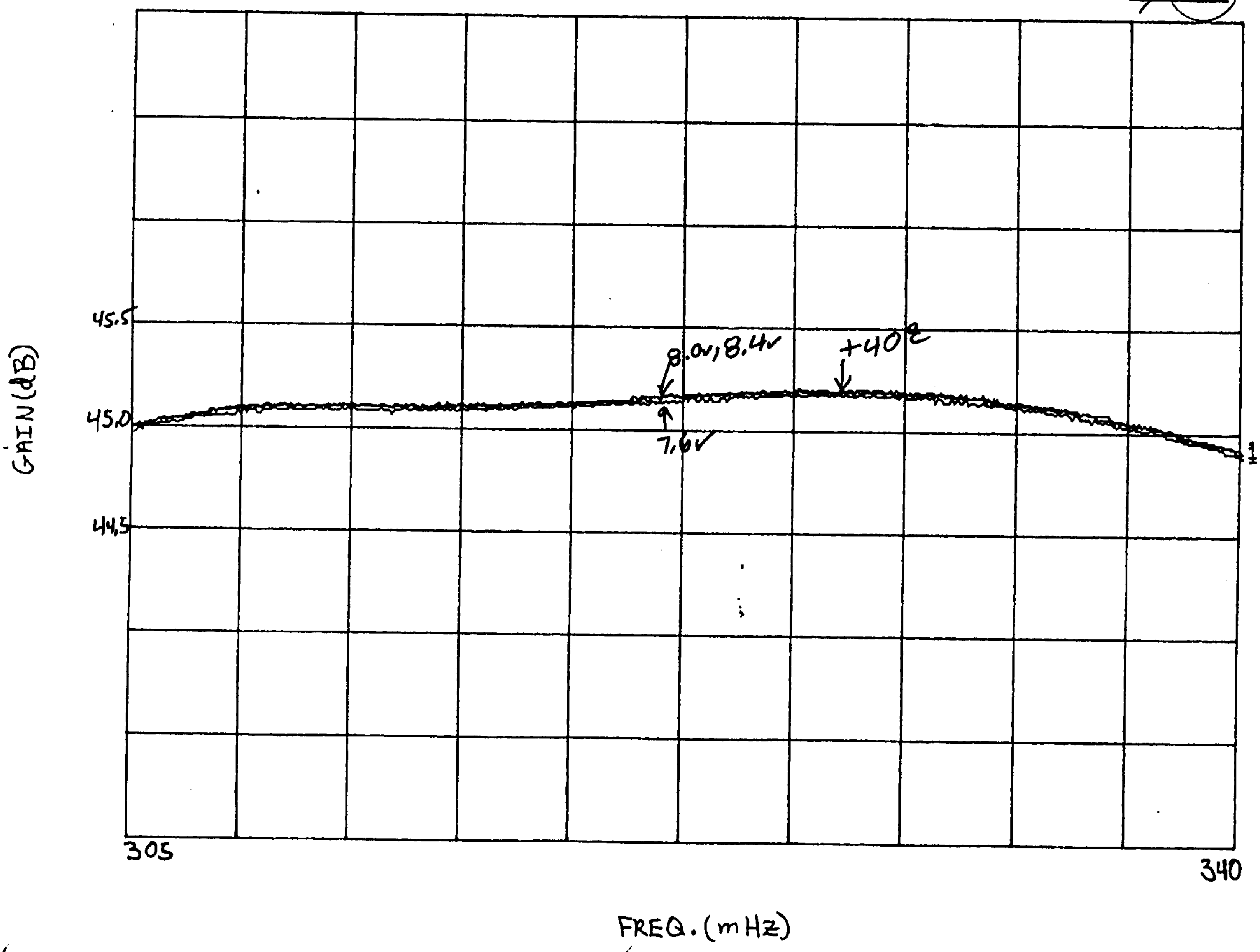
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH ~~GAS~~ T1145 DATE 4-17-97

P/N 1331579-12



Report No. 11491
June 1999

Channel 14 Amplifier

IF Amplifier (P/N:1331579-13, S/N: 109)

APPENDIX C
ATP1777 DATA SHEET
MODEL NUMBER UD315302
AEROJET P/N 1331579-13

S/N 109

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject ___			3-13-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			3-13-97
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject ___			3-13-97
	Short Open Protection	No Damage	Accept X Reject ___			3-13-97
	Output Coupling	Output shall be AC coupled	Accept X Reject ___			3-13-97
4.4.2	Gain vs. Freq. 315 MHz to 330 MHz	48.5dB Min., 49.5dB Max. -4°C to +40°C Attach x-y plot	Max 49.09 dB Min 48.91 dB Accept X Reject ___	Max 49.27 dB Min 49.14 dB Accept X Reject ___	Max 48.76 dB Min 48.54 dB Accept X Reject ___	3-13-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject ___ 0.18 dB	Accept X Reject ___ 0.13 dB	Accept X Reject ___ 0.22 dB	3-13-97
	Gain Temp. Sensitivity	$\pm$.44 dB from -4°C to +40°C Worse Case	Accept X Reject ___	Accept X Reject ___ 0.23 dB	Accept X Reject ___ 0.39 dB	3-13-97
4.4.3	Gain-Voltage Sensitivity Input Currents	$\leq$.5dB/v Worse Case $\pm$ .2dB for 7.6 to 8.4 Vdc 55ma MAX. 7.6v 8.0v 8.4v Attach X-Y Plot	0.04 dB 46.2 mA 46.9 mA 47.6 mA Accept X Reject ___	0.05 dB 44.6 mA 45.3 mA 45.9 mA Accept X Reject ___	0.04 dB 47.5 mA 48.2 mA 48.9 mA Accept X Reject ___	3-13-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1777 DATA SHEET
MODEL NUMBER UD315302
AEROJET P/N 1331579-13

S/N 109

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject ___			
		315 MHz	0.60 dB	0.65 dB	0.60 dB	
		322.5 MHz	0.60 dB	0.65 dB	0.60 dB	
		330 MHz	0.65 dB	0.70 dB	0.65 dB	3-13-97
4.4.8	Stability	Unconditionally Stable	Accept X Reject ___			3-13-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 60 mA	Accept X Reject ___			
		Maximum Current	49.6 mA			3-13-97

NOTE: Review all recorded data and signify acceptance below.

Technician SHoffman T143 Date: 3-13-97

Quality Assurance Dave Luna Date: 3-17-97

CSI: ______ Date: ______

GSI: ______ Date: 3-13-97

Amplica, Inc.
Newbury Park, CA 91320

DRAWN	SIZE A	FSCM NO. 51025	ATP1777	REV.
ISSUED	SCALE		SHEET 37 OF 39	

MODEL [illegible] [illegible]

GAIN VS FREQUENCY

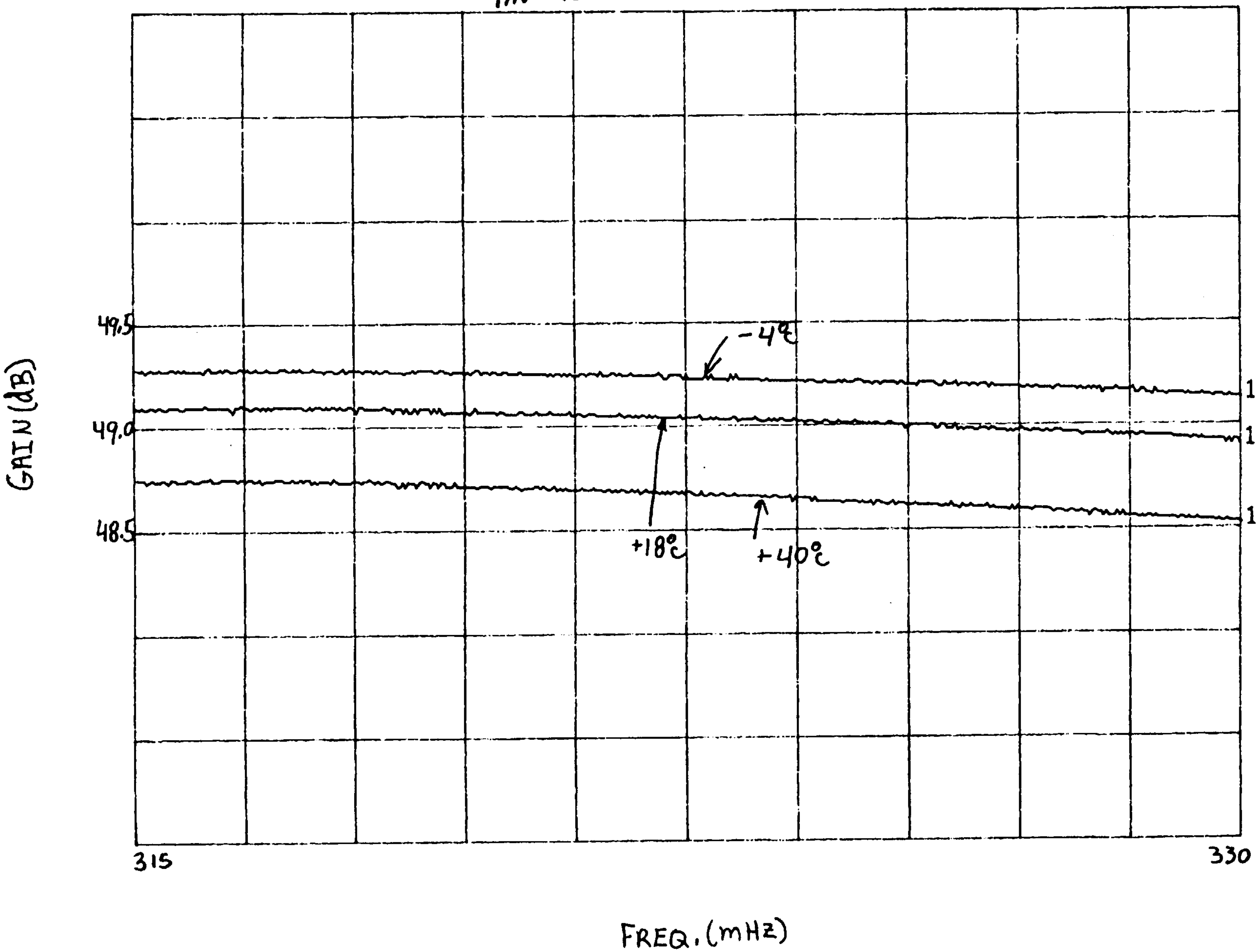
VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SA DATE 3-13-97

143

P/N 1331579-13



MODEL UD315306 S/N 107

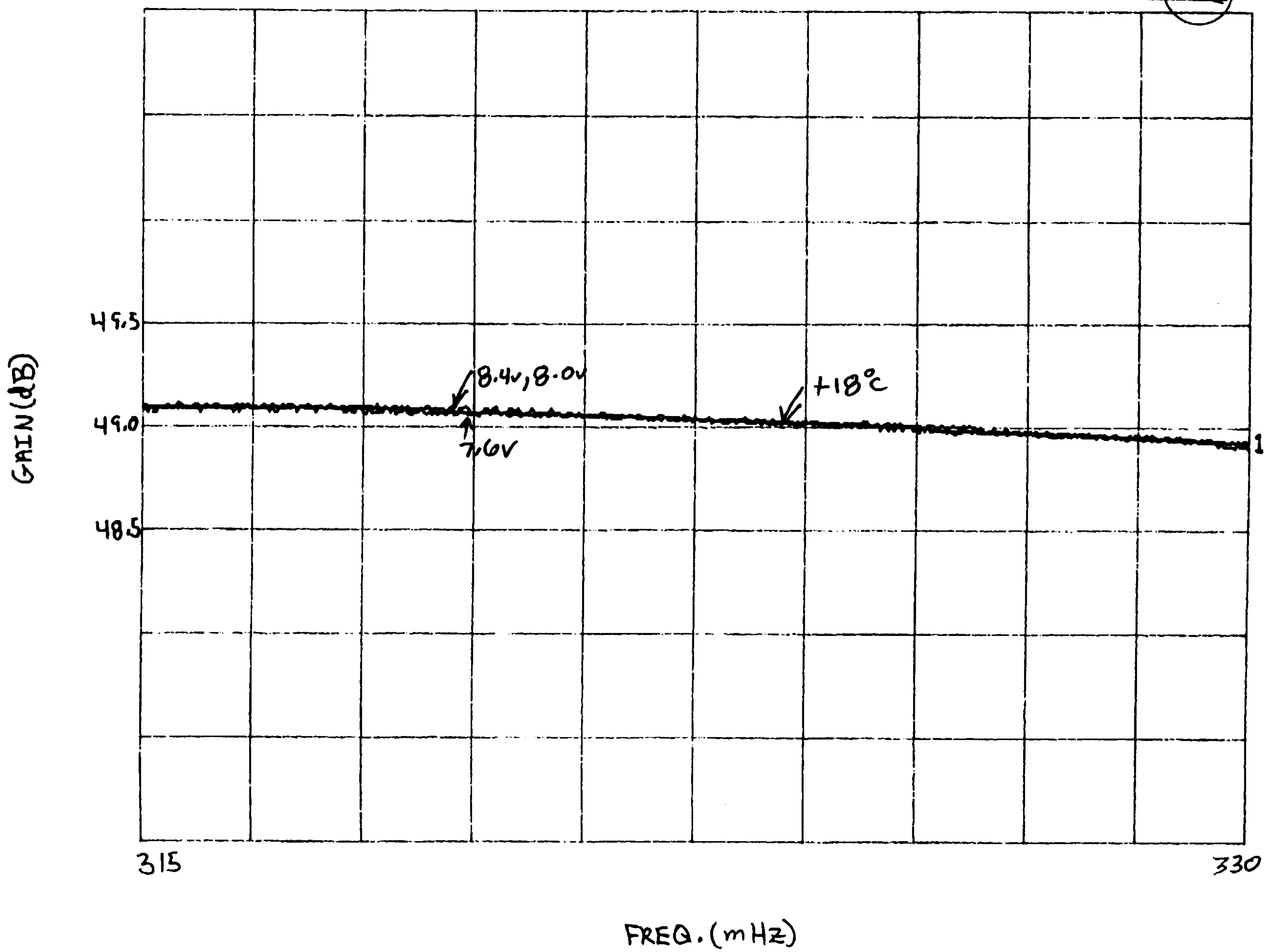
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SMS T143 DATE 3-13-97

P/N 1331579-13



MODEL UU315302 , N 107

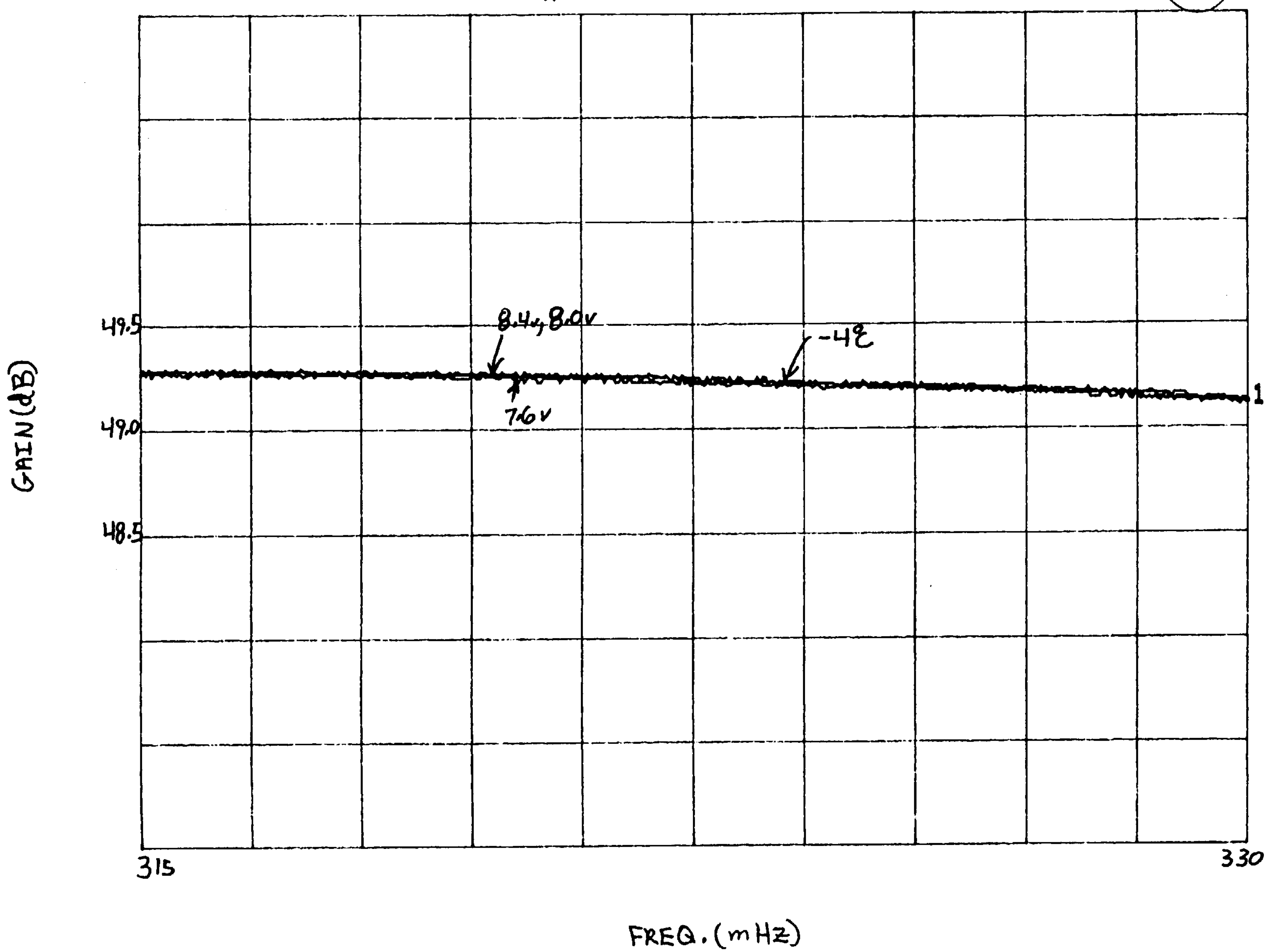
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SA (T143) DATE 3-13-97

P/N 1331579-13



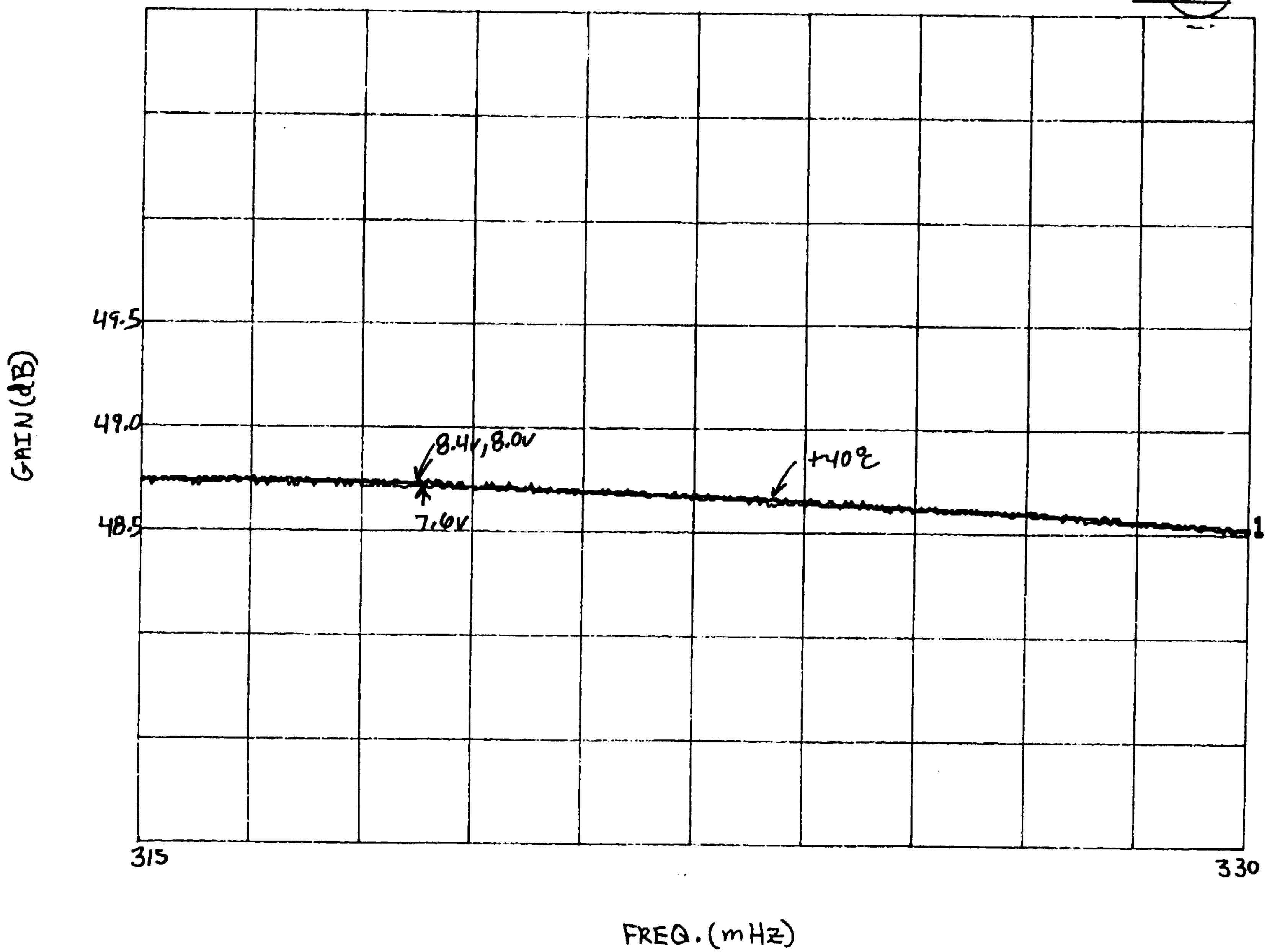
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH GW T143 DATE 3-13-97

P/N 1331579-13



Report No. 11491
June 1999

Channel 15 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-20, S/N: 7A60)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
1.13	1.00		QA 1

SPAR# 35
12/1/98

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	59.80	1.25	2.0	QA 1	
10.00	59.85				
10.04	59.90				
ΔGv =	0.10 dB				

		DATE	ACC	REJ
PART NO. 1331562- 206	SPACEK QA	10-28-98		QA 1

SER NO. 7A60 TEST FAILURE: ________

TESTED BY: 77K FAILURE ANALYSIS NO. ________

END DATE: 6-5-98

END TIME: 1600

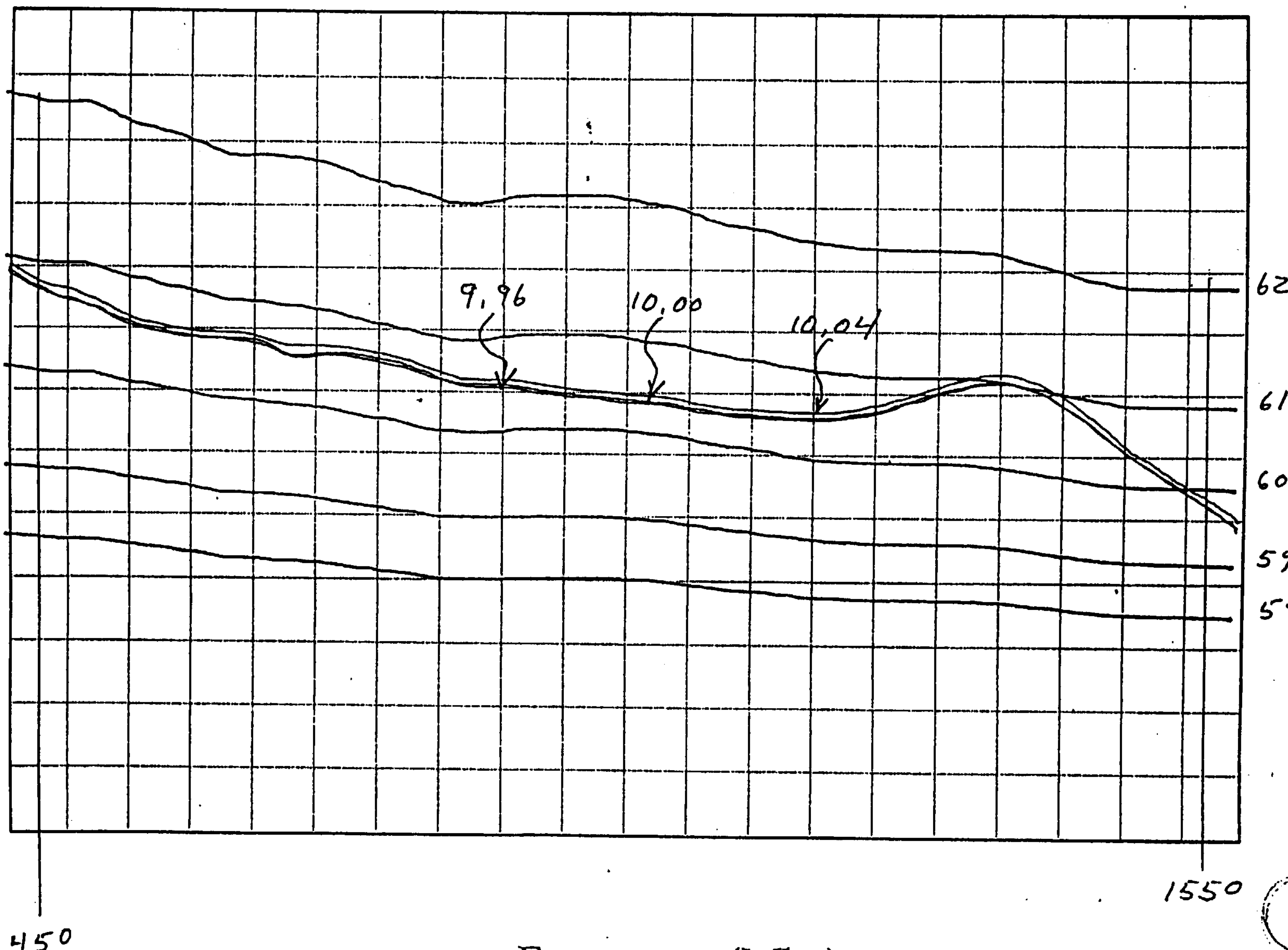
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-206
Serial No. 7A60
Date 5-27-98
Tested By 77H

Amb Temp +23 °c



QA 1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 −6	G_{T1} 61.10				
		* 0.036	0.035dB/°C		QA 1
T2 +8	G_{T2} 60.60				
		* 0.053	0.020dB/°C		QA 1
T3 +28	G_{T3} 59.55				
		* 0.046	0.035dB/°C		QA 1
T4 +40	G_{T4} 57.00				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \qquad i = 1,2,3,4$$

ΔG_T = 2.1 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 2.6 dB Spec 1.4dB ACC____ REJ QA 1

		DATE	ACC	REJ
PART NO. 1331562-20G	SPACEK QA	11-25-98		QA 1
SER NO. 7A60	TEST FAILURE:			
TESTED BY: 77A	FAILURE ANALYSIS NO.			
END DATE: 6-5-98				
END TIME: 1600				

ENGINEERING DATA ONLY. SEE AE24865 PARA. 3.2.1.15.1
acceptable

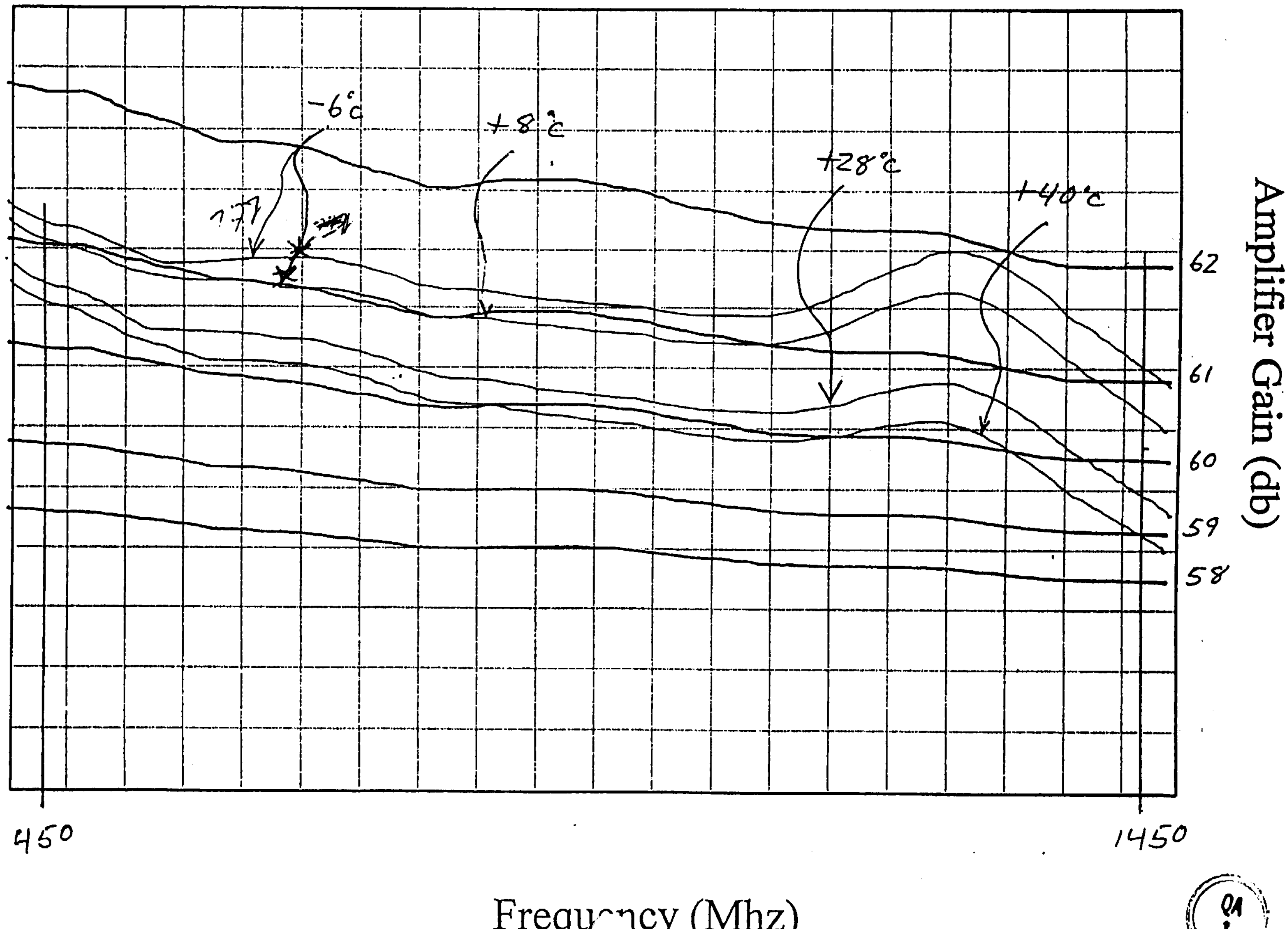
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-206
Serial No. 7A60
Date 5-27-98
Tested By 777

Amb Temp 23°C



QA

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10					
				X						20					
	X	X								50					
X	X	X	X	X	X	X	X			100					
X										150					
			X	X	X	X	X	X		200					
								X		400					
									X	500	-2.8	0.2	1.0	QA 1	
									X	1000	-2.7	0.3	1.0	QA 1	
									X	1500	-2.6	0.4	1.0	QA 1	

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-24.2	-27.1	2.9	1.83

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

PART NO. 1331562-20G

SPACEK QA — DATE: 10-28-98, ACC: QA 1, REJ:

SER NO. 7AG0

TEST FAILURE:

TESTED BY: [signature]

FAILURE ANALYSIS NO.

END DATE: 6-5-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 11-19-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	111.5	-23.00	-24.20	1.20	5.2	6.5	QA 1	
+8	111.7	-23.20	-24.35	1.15	5.1	6.5	QA 1	
+28	111.9	-23.50	-24.65	1.15	5.1	6.5	QA 1	
+40	112.1	-23.80	-24.95	1.15	5.1	6.5	QA 1	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ _____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 11-25-98 Ambient Room Temperature °C: 24

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.050

Record Nps(K) 0.15 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ _____

PART NO. 1331562-20B SPACEK QA DATE 11-25-98 ACC QA 1 REJ _____

SER NO. 7A60 TEST FAILURE: _____

TESTED BY: 77# FAILURE ANALYSIS NO. _____

END DATE: 11-25-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

Report No. 11491
June 1999

SUBSYSTEM-LEVEL TEST DATA

CENTER FREQUENCY OF LOs

Channel No.	3	4	5	6	7	8	9-14 ***	15
Specification (GHz) *	50.3	52.8	53.596	54.4	54.94	55.5	57.290344	89.0
Setting Accuracy (+/-GHz)	0.008	0.003	0.003	0.003	0.003	0.008	0.000086	0.08
Measured (GHz) **	50.30088	52.80055	53.59587	54.40085	54.94019	55.50067	57.290323 57.290315	88.97955

* Specification in vacuum condition.

** Measured at ambient pressure (standard atmosphere).

*** Measured data for PLO No. 1 and No.2.

Report No. 11491
June 1999

TEST DATA

FOR

AMSU-A1-2 (P/N: 1356409-1, S/N: F06)

TEST DATA SHEET 1

LO Frequency Test Data (Paragraph 3.5.1) (A1-1)

Test Setup Verified: [signature] Baseplate Temperature (T_B) 25 °C

Signature

Component	Channel No.		V_b(V)	I_b(mA)	P_{dc}(mW) Required (Max)	P_{dc}(mW) Measured	P_{dc} Pass/ Fail	f_o(GHz) Required	f_o(GHz) Measured	f_o Pass/ Fail
LO	6		+9.97	180.98	2,700	1804.37	P	54.400 ± 0.003	54.40084	P
LO	7		+9.94	175.66	2,700	1746.06	P	54.940 ± 0.003	54.94019	P
LO	LO No. 1	9	Positive		9,000 (13,500)*			57.290344 ± 0.000086		
LO	LO No. 1	10								
LO	LO No. 1	11	+15.14	520.4		7878.86	P		57.29032	P
LO	LO No. 1	12	Negative		1,500					
LO	LO No. 1	13								
LO	LO No. 1	14	-15.14	-67.94		1028.61				
LO	LO No. 2	9	Positive		9,000 (13,500)*			57.290344 ± 0.000086		
LO	LO No. 2	10								
LO	LO No. 2	11	+15.11	691.89		10454.46	P		57.29031	P
LO	LO No. 2	12	Negative		1,500					
LO	LO No. 2	13								
LO	LO No. 2	14	-15.14	-67.53		1022.40	P			
LO	15		+14.89	156.68	3500	2332.97	P	88.980 ± 0.080	~~88.895~~ 88.97918	P
Mixer/ Amps	All		+9.94	248.74	2,550	2472.48				
IF Amps	All		+7.96	243.5	5,500	2097.46				
TOTAL			Primary (LO#1)		24,510 (29,010)*	19360.81				
TOTAL			Redundancy (LO#2)		24,510 (29,010)*	21930.20				

* Indicates required values for the PLO specified in AE-26660.

Pass = P, Fail = F

PLO 1 Lock Detect ☑ 14.26V

PLO 2 Lock Detect ☑ ~~0.027 V~~ 13.67v

S/O# 622627

Part No.: 1356429-2

Serial No.: F06

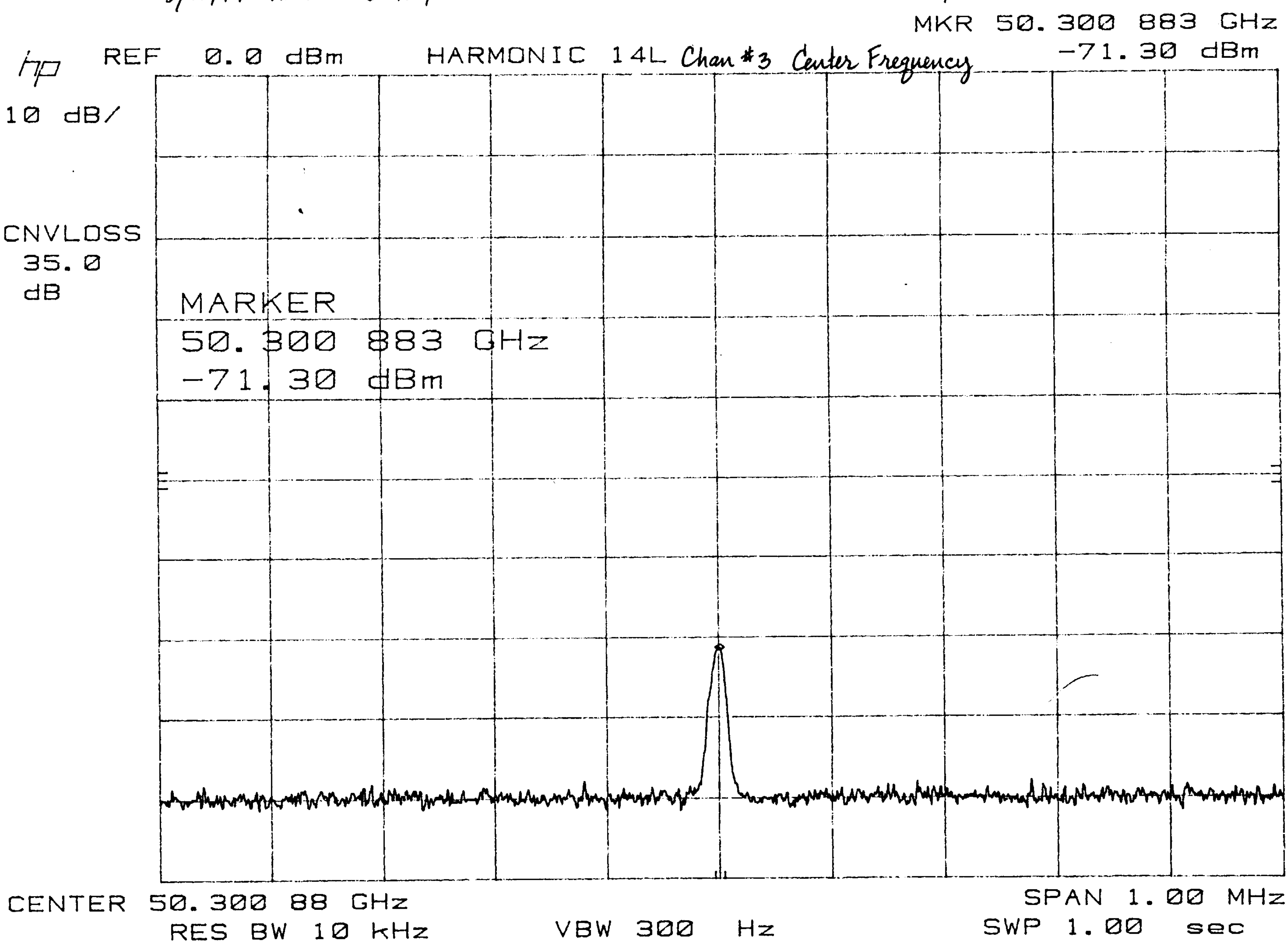
Test Engineer: [signature]

Quality Assurance: [stamp] 003

Date: 6/1/99

5/21/99 Al-2 F06 ATP

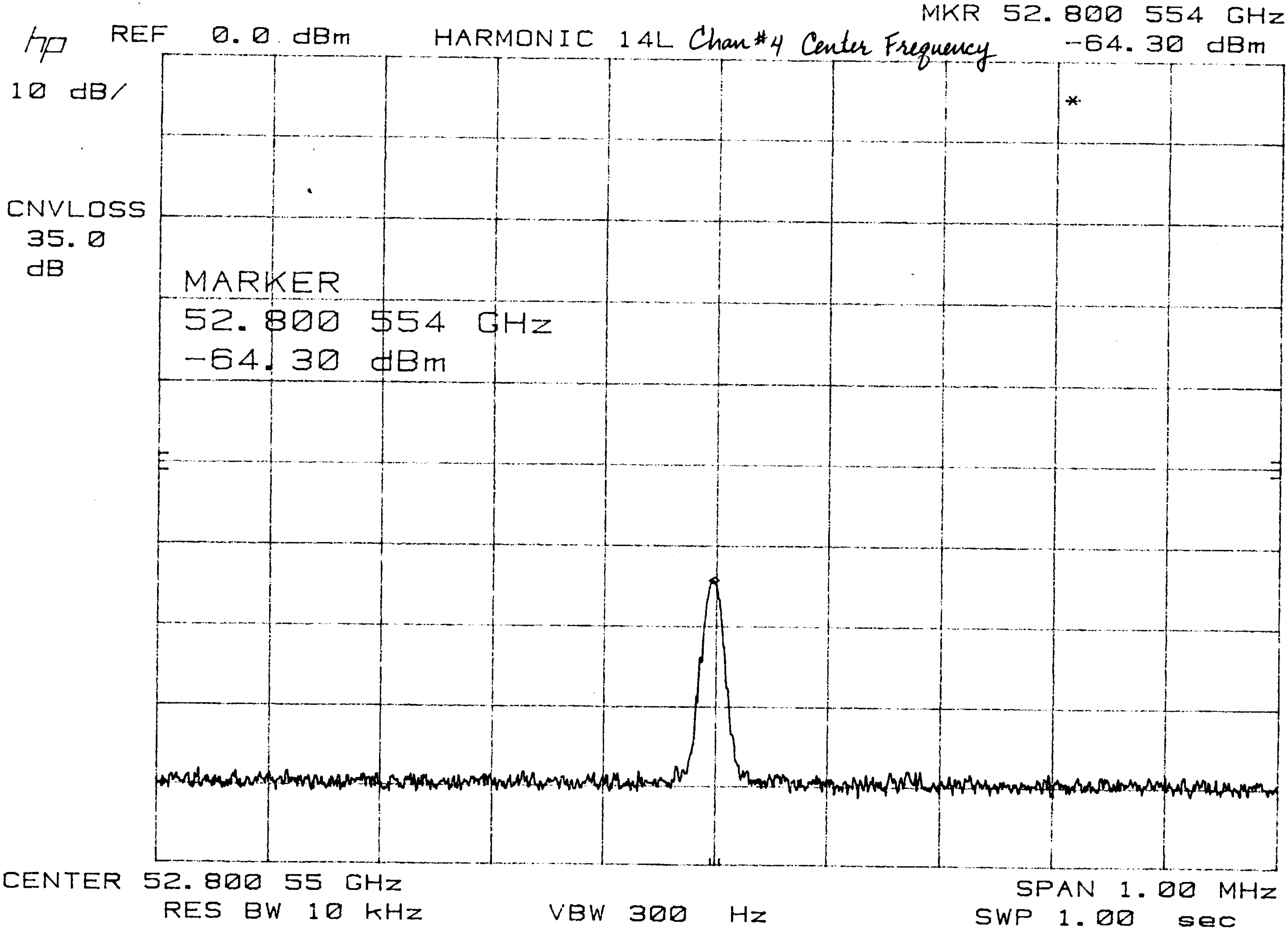
FOR REFERENCE ONLY S/O: 339360 oper: 5900



5/21/99

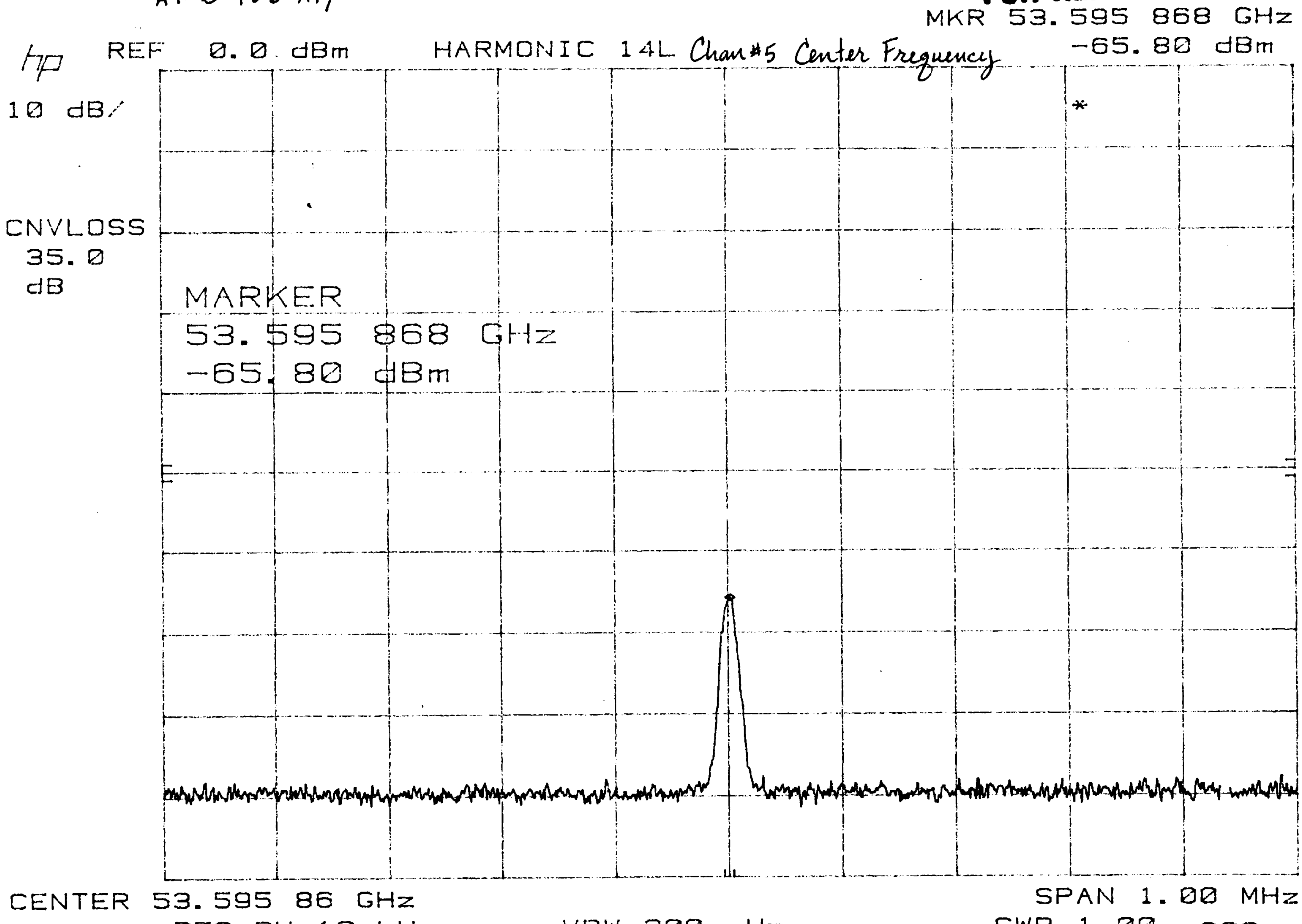
A1-2 F06 ATP

FOR REFERENCE ONLY S/O: 339360
oper #: 5900



5/21/99
A1-2 F06 ATP

FOR REFERENCE ONLY



S/O: 336390; oper#: 5900

5/21/99
A1-2 FOL ATP

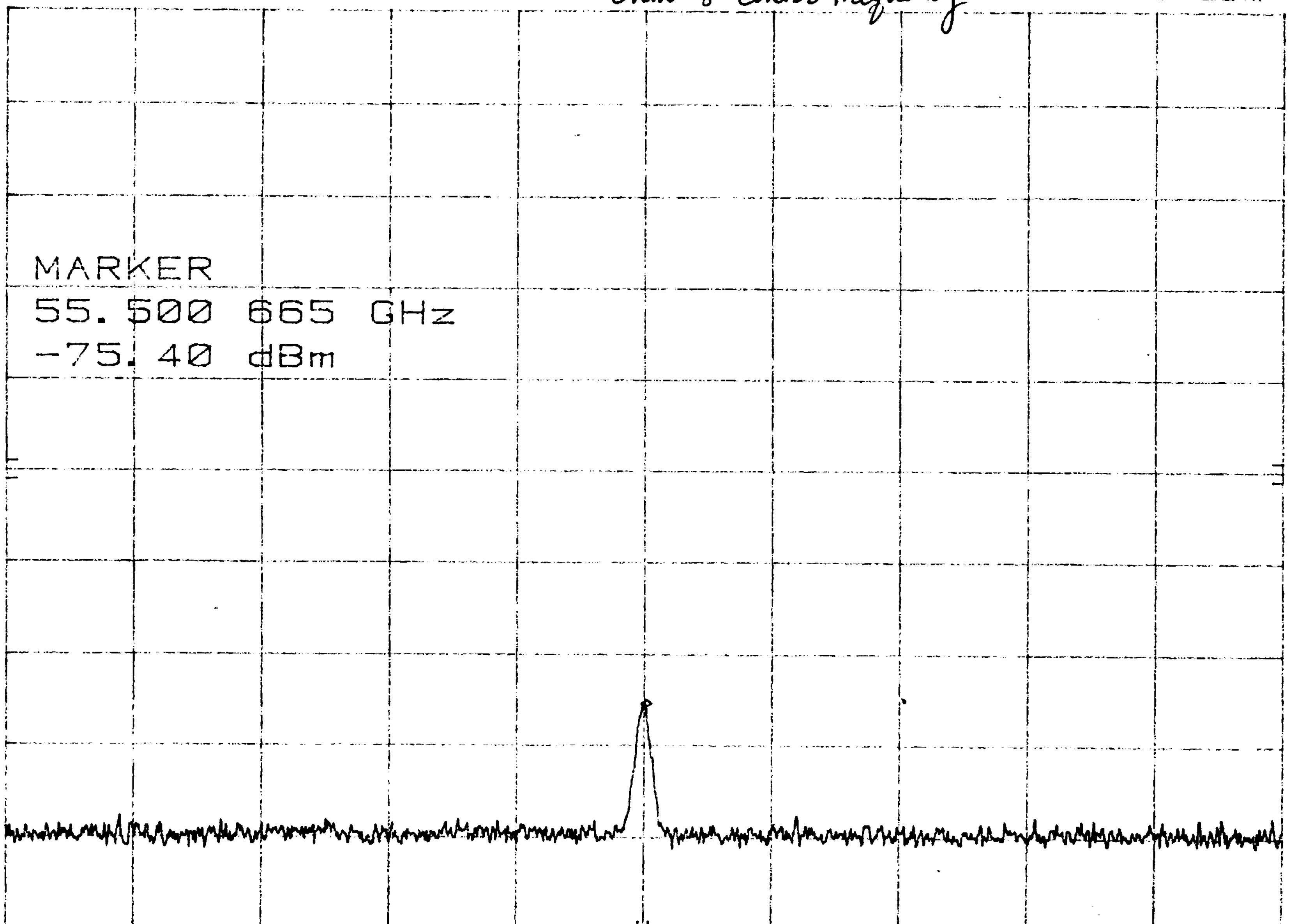
FOR REFERENCE ONLY

MKR 55.500 665 GHz
-75.40 dBm

hp REF 0.0 dBm HARMONIC 14L. Chan #8 Center Frequency

10 dB/

CNVLOSS
35.0
dB



CENTER 55.500 66 GHz
RES BW 10 kHz VBW 300 Hz
SPAN 1.00 MHz
SWP 1.00 sec

TEST DATA SHEET 5
IF Output Test Data (Paragraph 3.5.2) (A1-2)

Test Setup Verified: Y. Trinh (Signature)   Baseplate Temperature (T_B) 28.0 °C

Component	Channel No.	V_b(V)	I_b(mA)	P_o(dBm)	Atten (dB)	P_o(dBm) Required	P_o(dBm) Measured	Pass/Fail
LO	3	9.93	187.0	-25.28	2	−27.0 ± 1.0	-27.18	P
	4	10.02	204.6	-18.98	8	−27.0 ± 1.0	-27.05	P
	5	10.0	184.0	-20.01	7	−27.0 ± 1.0	-27.26	P
	8	9.99	187.0	-19.77	7	−27.0 ± 1.0	-26.92	P
Mixer/Amps	All	10.02	173.2					

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

Quality Assurance: Kona (QA 97) 5-21-99

Date: 5/21/99

TEST DATA SHEET 8 (Sheet 1 of 2)
Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 28.0 °C

Compo-nent	Channel No.	V_b(V)	I_b(mA)	3 dB BW Frequency (MHz)		3 dB BW Frequency (MHz)		Pass/ Fail
				Lower	Higher	Required Max.	Measured	
LO	3	9.93	187.0	8.9	88.5	90	79.6	P
	4	10.02	204.6	8.0	198.2	200	190.2	P
	5	10.0	184.0	31.2	199.6	170	168.4	P
	8	9.99	187.0	7.5	162.7	163	155.2	P
Mixer/ Amps	All	10.02	173.2					

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

Quality Assurance: [signature] 7A 197 5-21-99

Date: 5/21/99

TEST DATA SHEET 8 (Sheet 2 of 2)
Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 28.0 °C

Component	Channel No.	V_b(V)	I_b(mA)	40 dB BW Frequency (MHz)		40 dB BW Frequency (MHz) (Ref. Only)		Pass/ Fail
				Lower	Higher	Required Max.	Measured	
LO	3	9.93	137.0	3.5	99.0	234	95.5	P
	4	10.02	204.6	2.3	221.0	234	218.7	P
	5	10.0	184.0	19.0	217.0	221	198	P
	8	9.99	187.0	2.2	180	429	177.8	P
Mixer/ Amps	All	10.02	173.2					

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

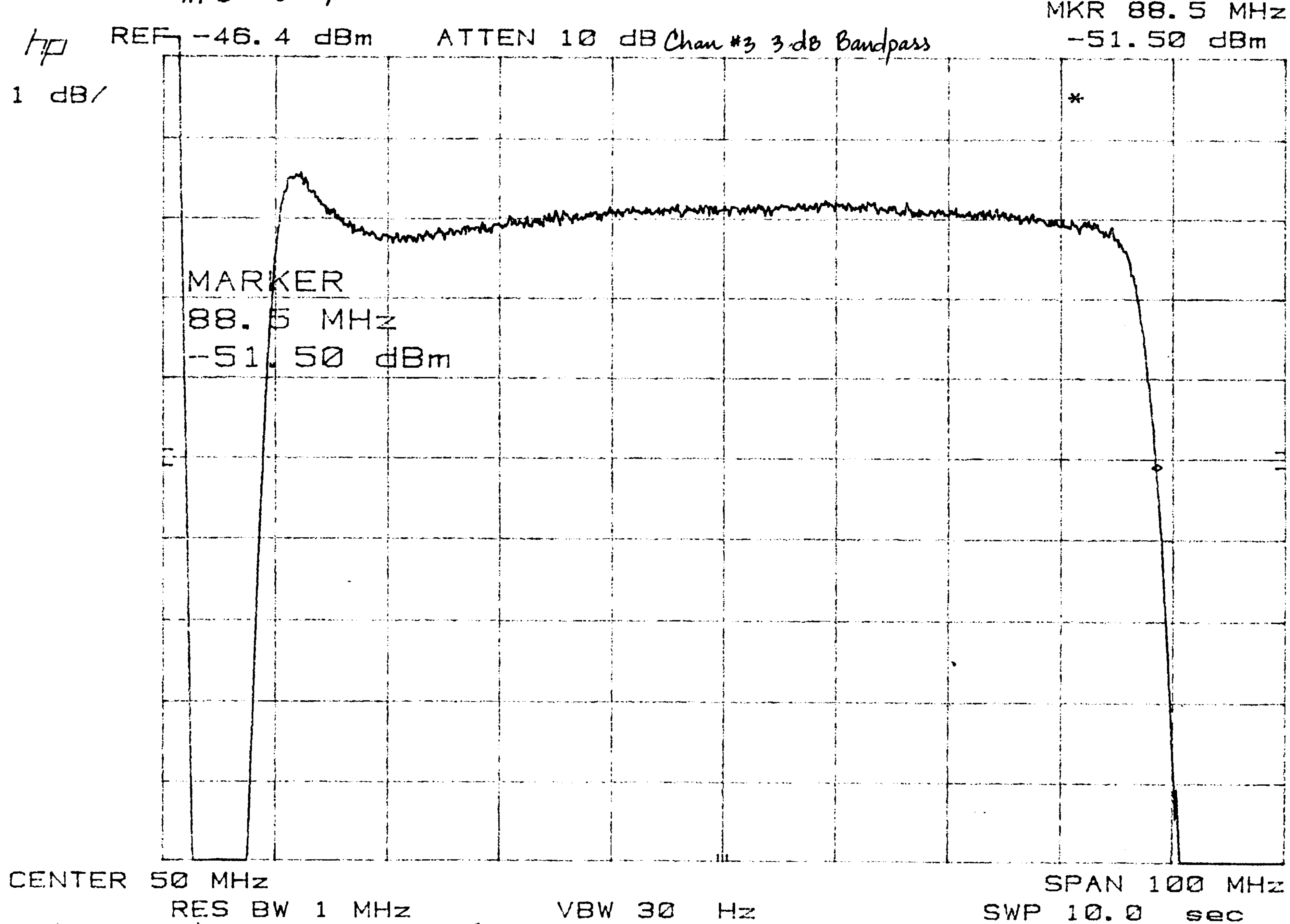
Quality Assurance: 7A 197 5-21-99

Date: 5/21/99

5/21/99

A1-2 FOG ATP

FOR REFERENCE ONLY



s/o #: 339360, ORDER #: 5900

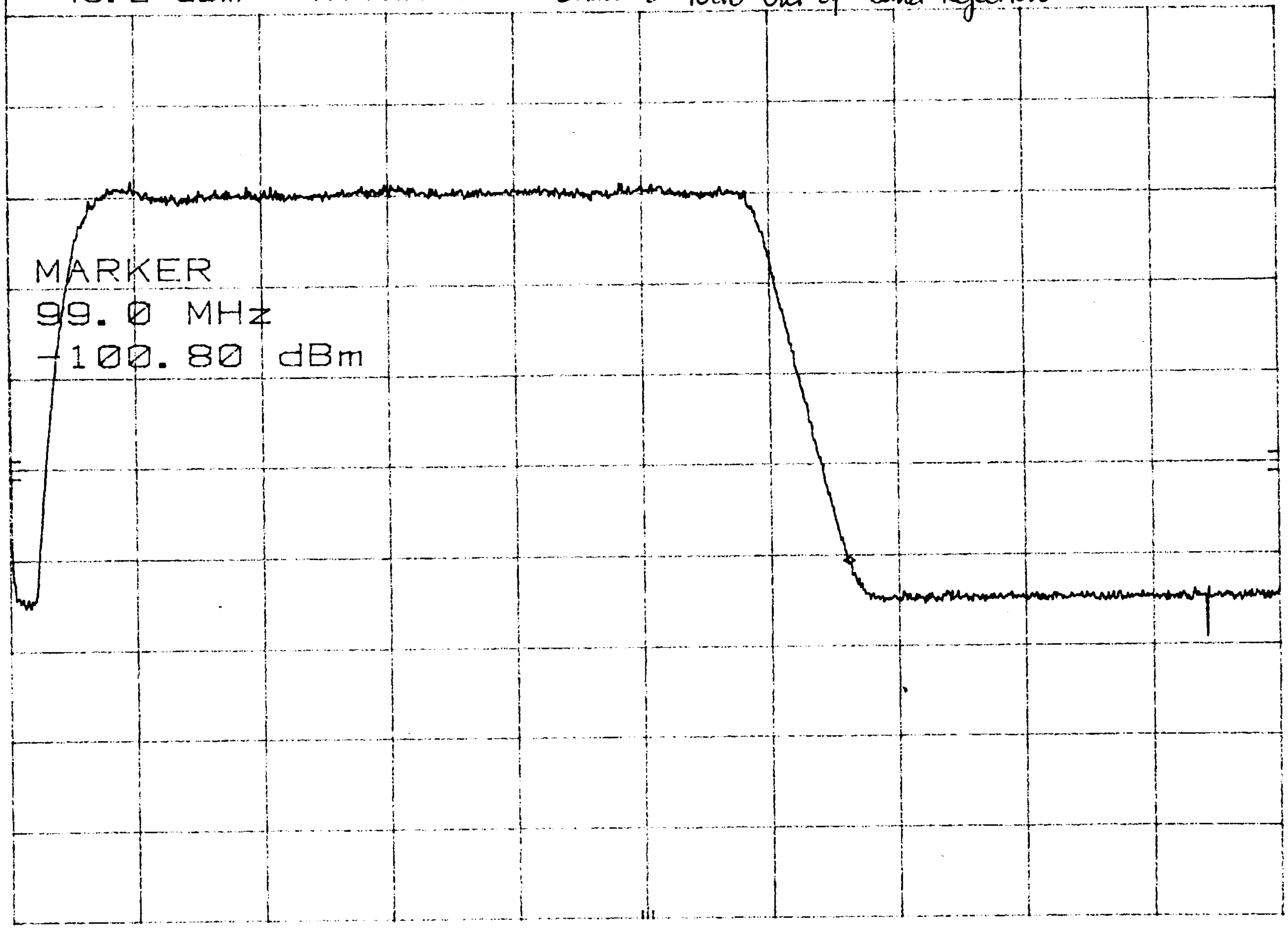
5/21/99
A1-2 F06 ATP

FOR REFERENCE ONLY

MKR 99.0 MHz
-100.80 dBm

hp REF -40.2 dBm ATTEN 0 dB Chan #3 40dB Out-of-Band Rejection

10 dB/



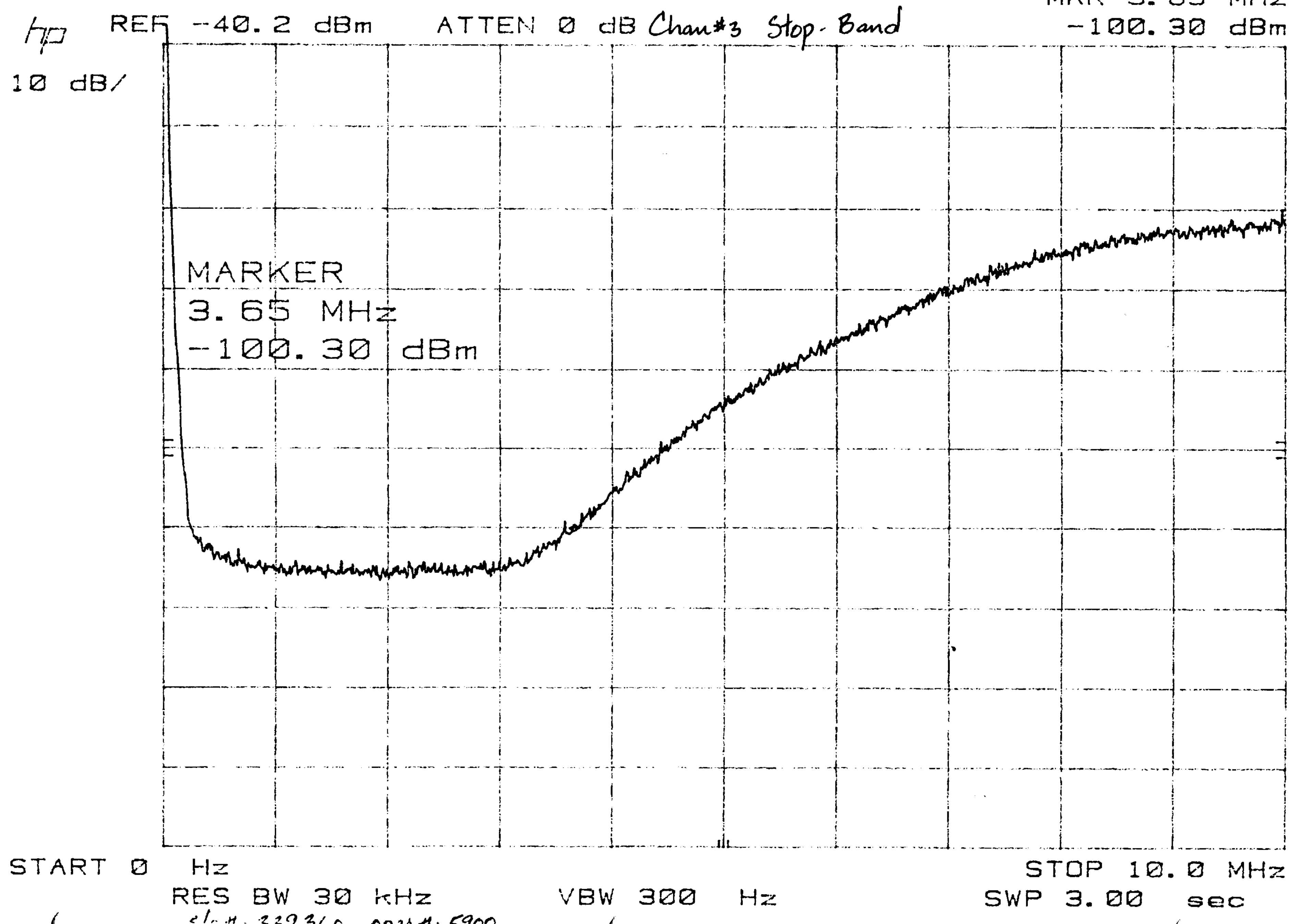
CENTER 75 MHz
RES BW 30 kHz VBW 300 Hz

SPAN 150 MHz
SWP 45.0 sec

s/n #: 339360 oper #: 5900

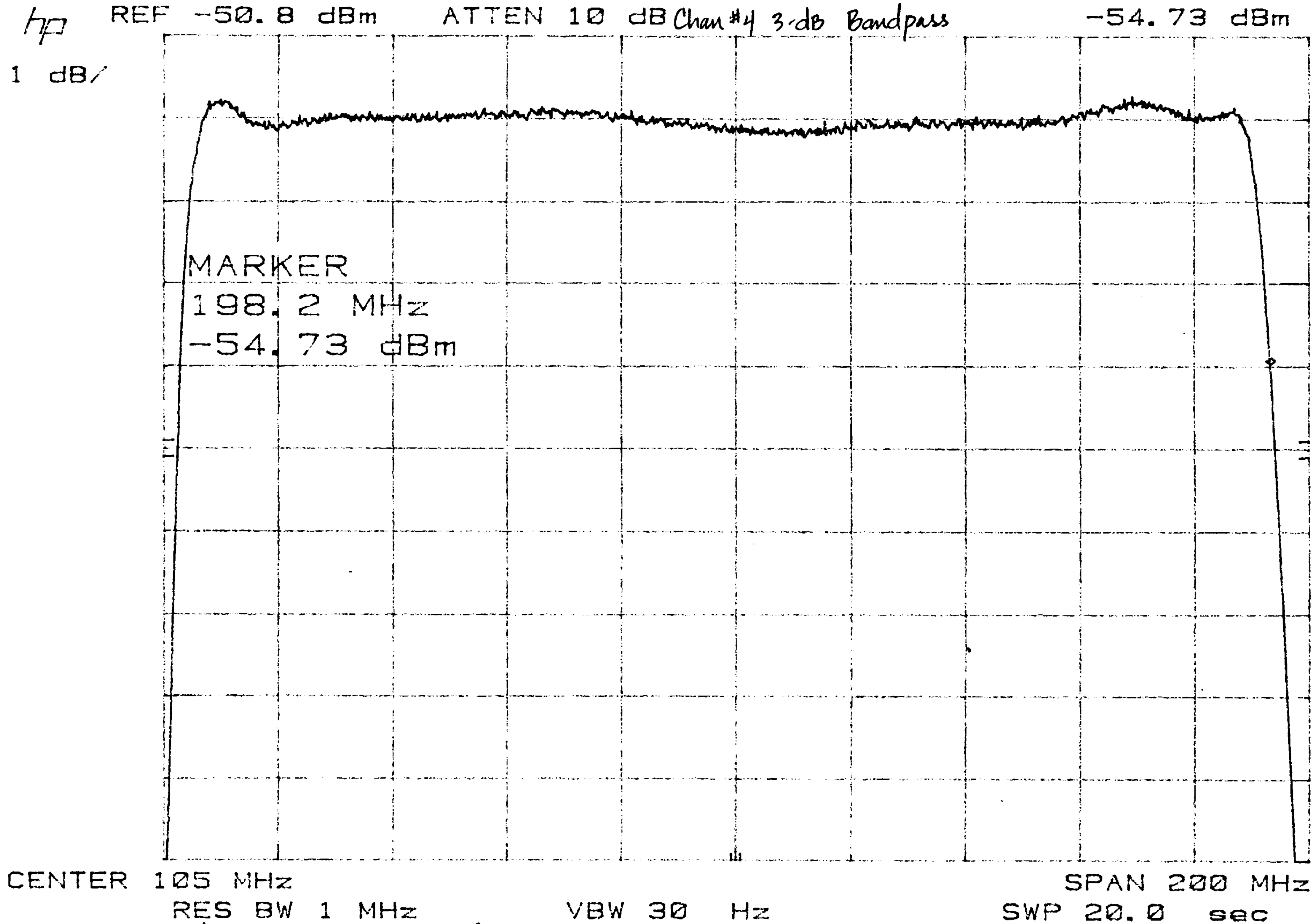
5/21/99
A1-2 F06 ATP

FOR REFERENCE ONLY



5/21/97
A1-2 F06 ATP

FOR REFERENCE ONLY

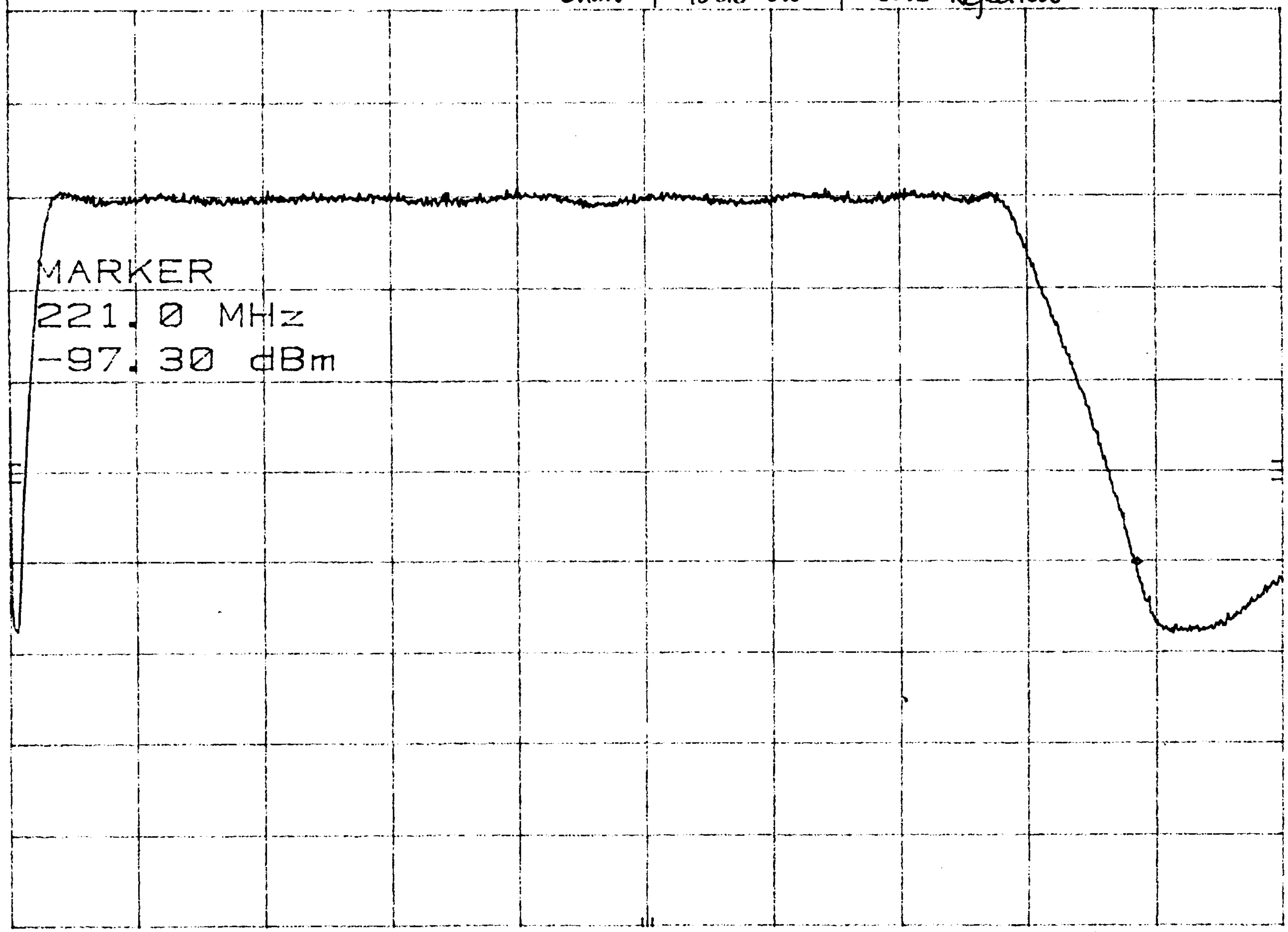


5/21/99
A1-2 F06 ATP

MKR 221.0 MHz

hp REF -37.2 dBm ATTEN 0 dB Chan #4 40dB Out-of-Band Rejection -97.30 dBm

10 dB/



CENTER 125 MHz SPAN 250 MHz

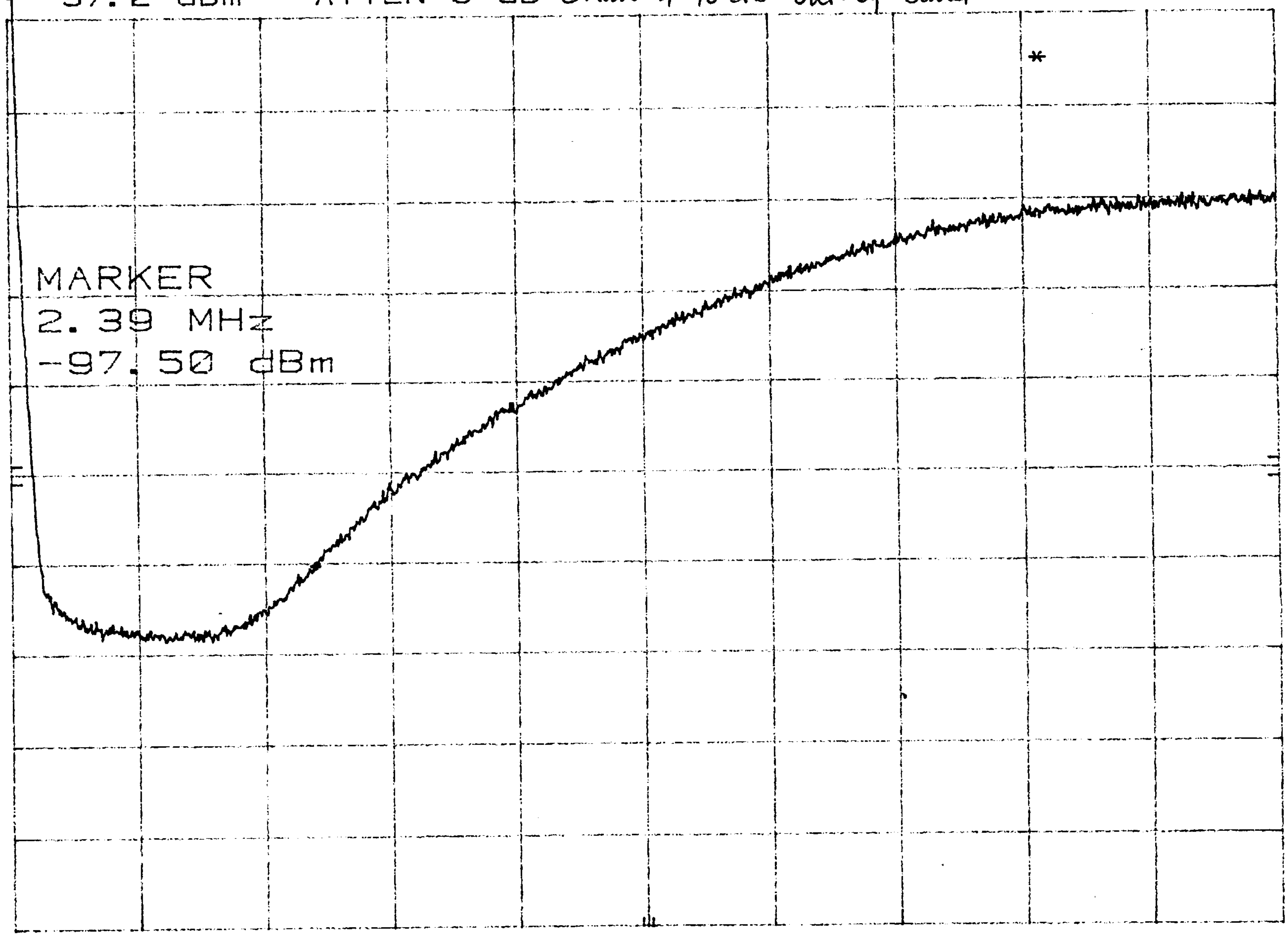
RES BW 30 kHz VBW 300 Hz SWP 75.0 sec

S/n #: 339360. oper#: 5900

5/21/99
A1-2 F06 ATP

hp REF -37.2 dBm ATTEN 0 dB Chan#4 40-dB Out-of-Band MKR 2.39 MHz -97.50 dBm

10 dB/



START 0 Hz STOP 10.0 MHz

RES BW 30 kHz VBW 300 Hz SWP 6.00 sec

s/n#: 33i-290 oper#: 5900

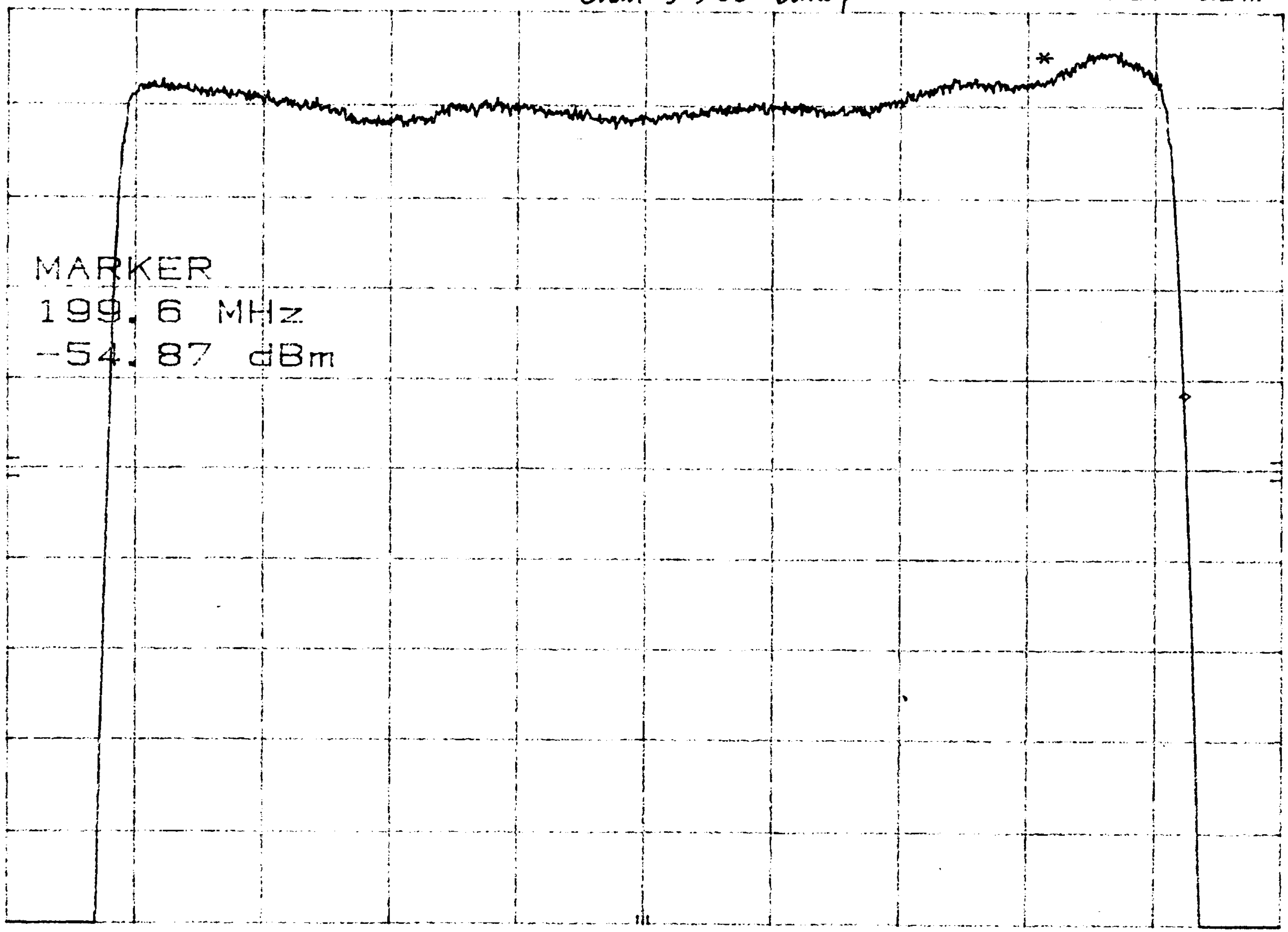
5/21/99
A1-2 F06 ATP

FOR REFERENCE ONLY

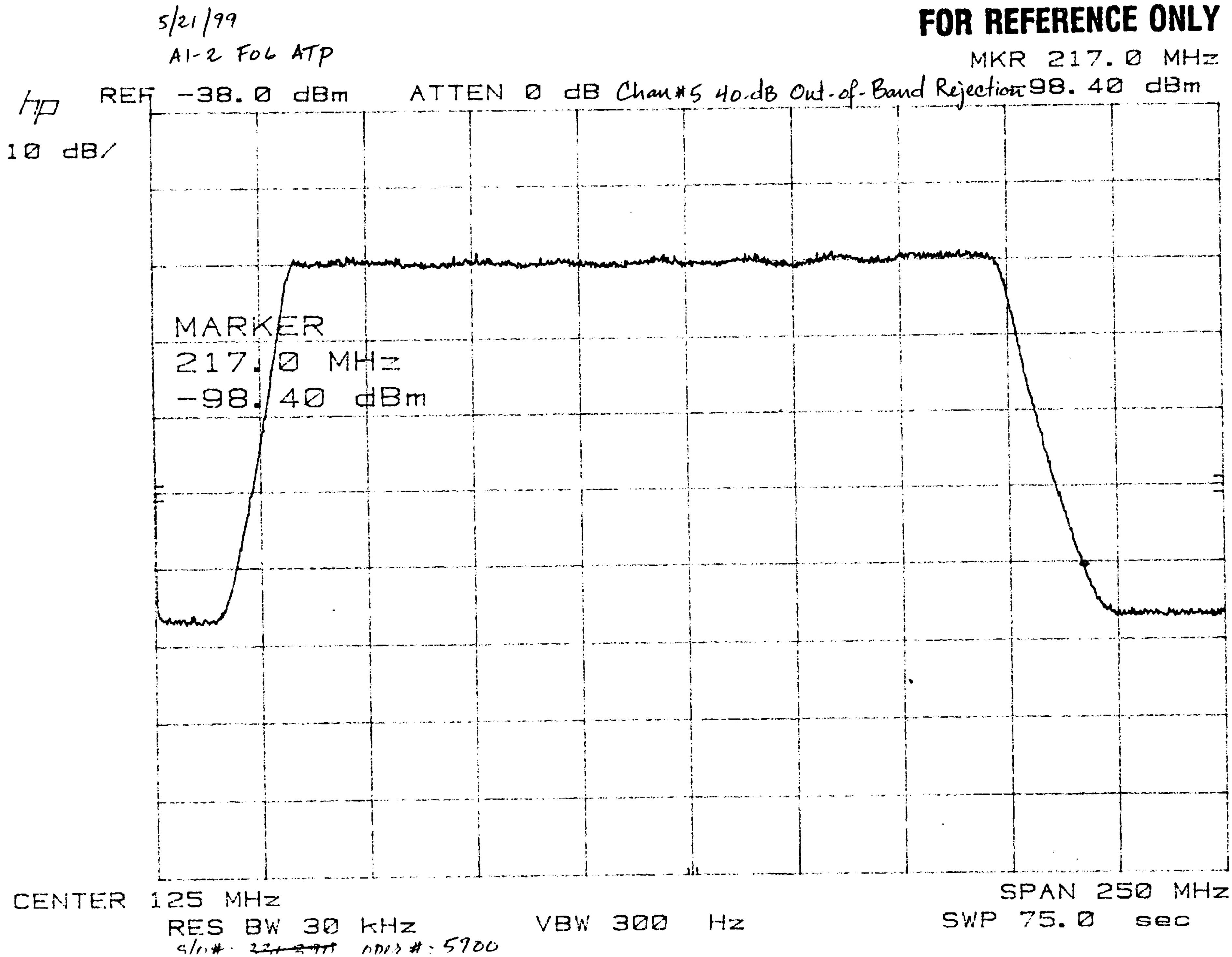
MKR 199.6 MHz
-54.87 dBm

hp REF -50.7 dBm ATTEN 10 dB Chan#5 3-dB Bandpass

1 dB/



CENTER 115 MHz SPAN 200 MHz
RES BW 1 MHz VBW 30 Hz SWP 20.0 sec
s/n#: 339360, oper#: 5900


5/21/99
A1-2 FOL ATP
FOR REFERENCE ONLY
MKR 217.0 MHz
hp
REF -38.0 dBm
ATTEN 0 dB
Chan#5 40 dB Out-of-Band Rejection
-98.40 dBm
10 dB/
MARKER
217.0 MHz
-98.40 dBm
CENTER 125 MHz
RES BW 30 kHz
VBW 300 Hz
SPAN 250 MHz
SWP 75.0 sec

5/21/99

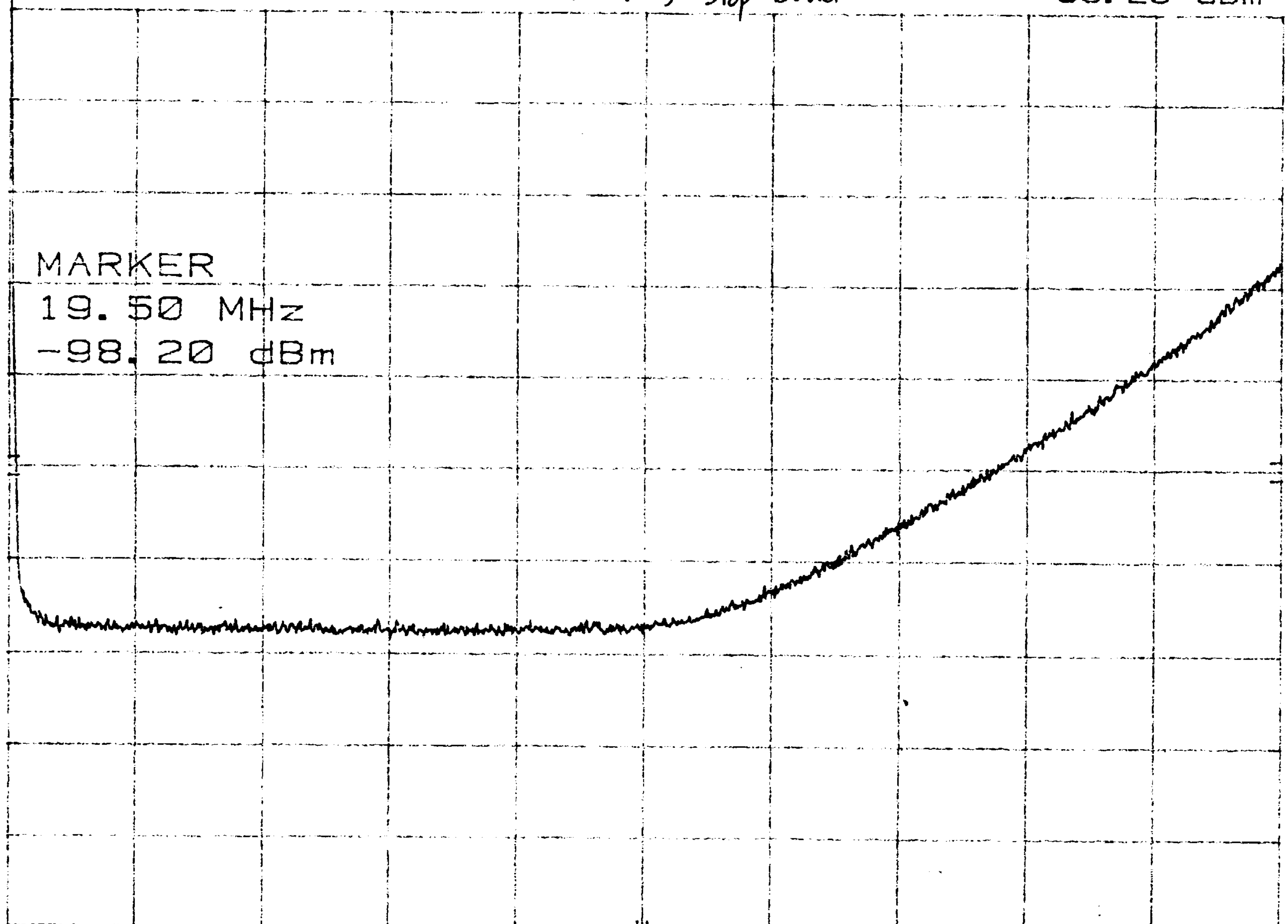
A1-2 F06 ATP

FOR REFERENCE ONLY

MKR 19.50 MHz
-98.20 dBm

hp REF -38.0 dBm ATTEN 0 dB Chan #5 Stop-Band

10 dB/



START 0 Hz STOP 30.0 MHz

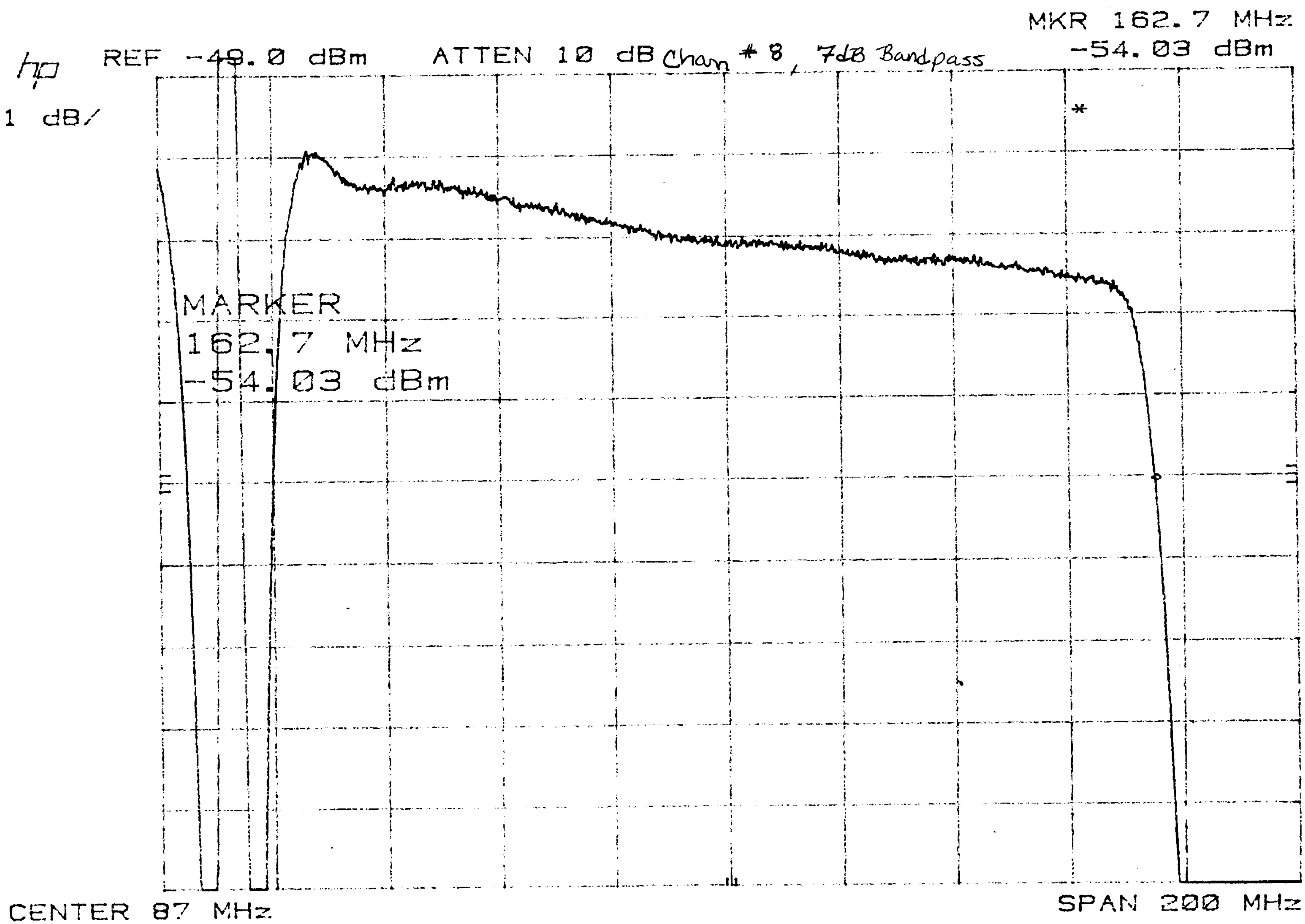
RES BW 30 kHz VBW 300 Hz SWP 9.00 sec

ORCH# 5900

5/21/99

A1-2 F06 ATP

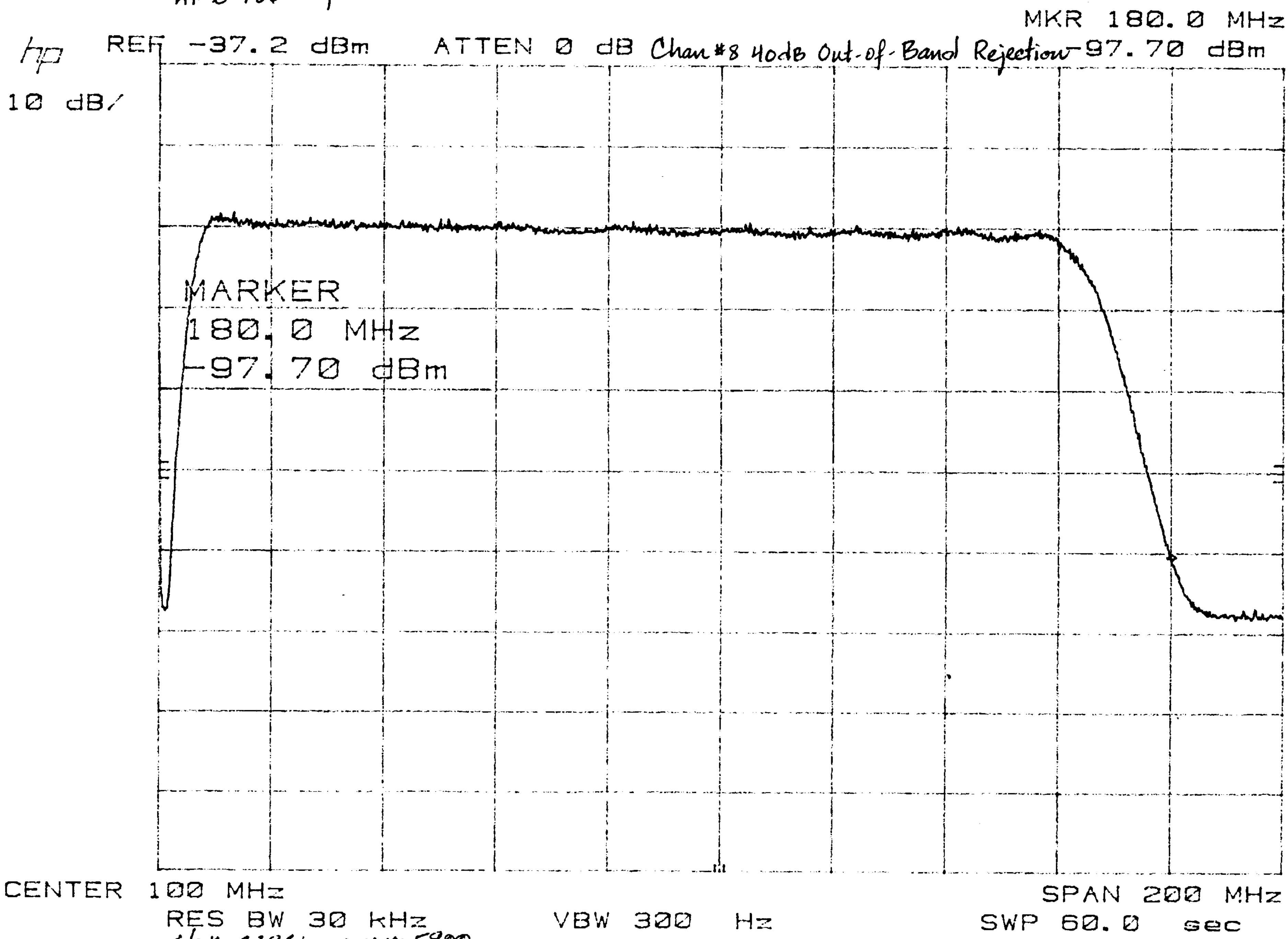
FOR REFERENCE ONLY



S/O# 339360, oper # 5900

5/21/99
A1-2 F06 ATP

FOR REFERENCE ONLY

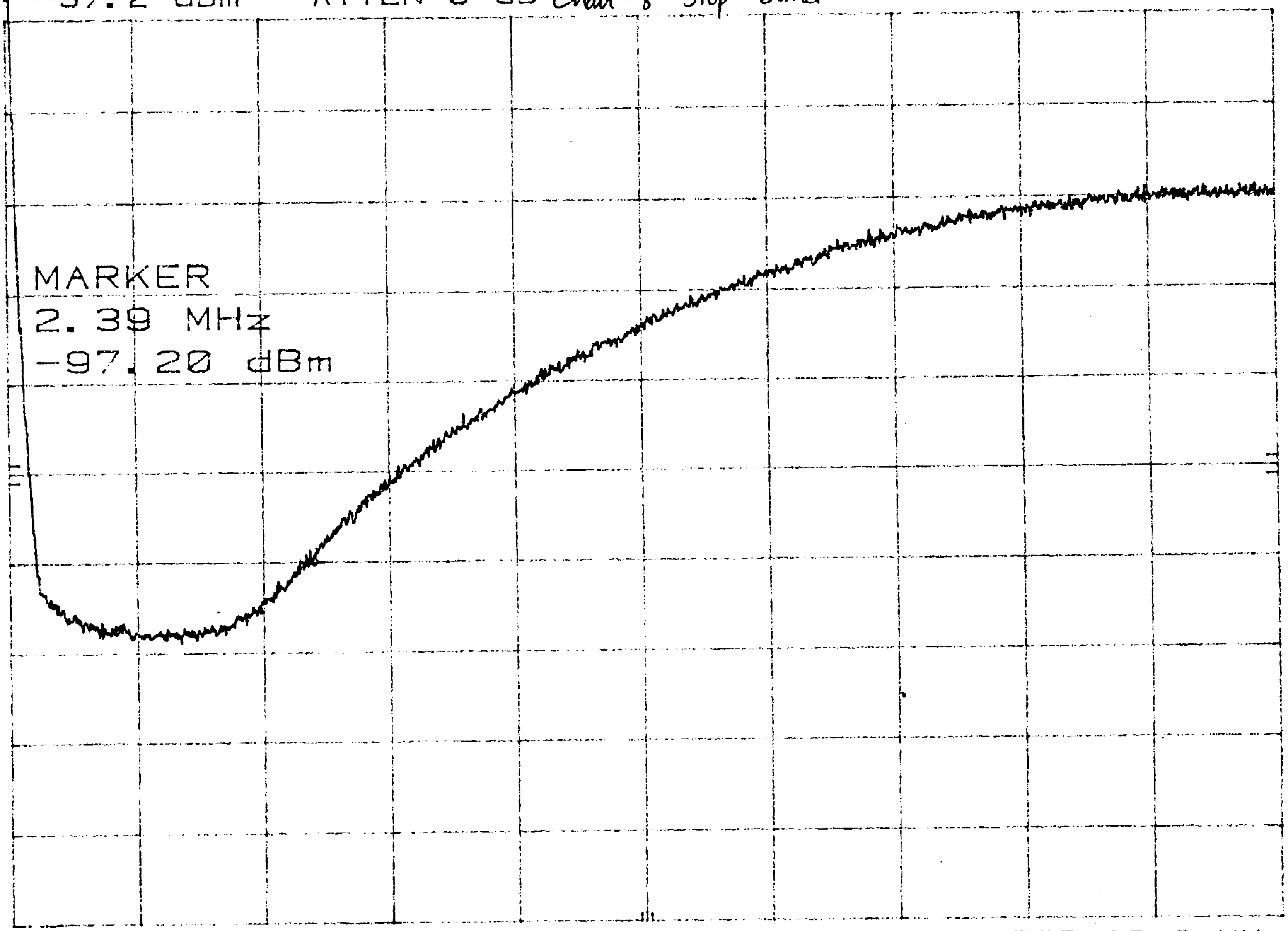


5/21/99
Al-2 F06 ATP

FOR REFERENCE ONLY

MKR 2.39 MHz
-97.20 dBm

hp REF -37.2 dBm ATTEN 0 dB Chan #8 Stop- Band
10 dB/



START 0 Hz
RES BW 30 kHz
S/O#: ~~[illegible]~~ ORDER# 5900

VBW 300 Hz

STOP 10.0 MHz
SWP 6.00 sec

TEST DATA SHEET 11 (Sheet 1 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: Y. Trinh (Signature) Baseplate Temperature (T_B) 28.0 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	3	9.93	187.0	22.0	0.8916	.000230	-194.0	0.6373	.000221
				22.0	0.8916	.000241	-194.0	0.6390	.000263
				22.0	0.8915	.000226	-194.0	0.6402	.000221
				22.0	0.8916	.000262	-194.0	0.6420	.000213
				22.0	0.8917	.000239	-194.0	0.6414	.000227
				22.0	0.8916	.000260	-194.0	0.6433	.000235
				22.0	0.8916	.000234	-194.0	0.6423	.000229
				22.0	0.8916	.000254	-194.0	0.6413	.000216
				22.0	0.8916	.000230	-194.0	0.6410	.000243
				22.0	0.8916	.000245	-194.0	0.6416	.000262
Mixer/ Amps	All	10.02	173.2						

Part No.: 1356409-1
Serial No.: F06

Test Engineer: Y. Trinh
Quality Assurance: [signature] 5-24-99
Date: 5/21/99

TEST DATA SHEET 11 (Sheet 5 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 28.0 °C

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
3		4.14				0.074			
		4.17				0.041			
		4.19				0.084			
		4.22				0.079			
		4.21				0.052			
		4.24				0.073			
		4.23				0.066			
		4.21				0.053			
		4.20				0.075			
		4.21				0.016			
	5.1		4.20	P	0.12		0.061	0.068	P

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

Quality Assurance: [signature] 5/21/99

Date: 5/21/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-2 F06 ATP CHANNEL 3 TB 28 5/21/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	.89164179	.00022989	----------	----------
2	COLD TEST	79.15	.63733199	.00022123	4.13919646	.07445640
3	WARM TEST	295.15	.89155117	.00024133	----------	----------
4	COLD TEST	79.15	.63904046	.00026289	4.16979554	.04085429
5	WARM TEST	295.15	.89154714	.00022556	----------	----------
6	COLD TEST	79.15	.64016548	.00022146	4.18936985	.08437128
7	WARM TEST	295.15	.89164697	.00026247	----------	----------
8	COLD TEST	79.15	.64195120	.00021271	4.21928073	.07907347
9	WARM TEST	295.15	.89166293	.00023968	----------	----------
10	COLD TEST	79.15	.64137602	.00022662	4.20902019	.05153760
11	WARM TEST	295.15	.89155482	.00025975	----------	----------
12	COLD TEST	79.15	.64325151	.00023470	4.24327826	.07252907
13	WARM TEST	295.15	.89162736	.00023390	----------	----------
14	COLD TEST	79.15	.64233701	.00022879	4.22628905	.06611414
15	WARM TEST	295.15	.89163382	.00025350	----------	----------
16	COLD TEST	79.15	.64130398	.00021587	4.20812757	.05269275
17	WARM TEST	295.15	.89160799	.00022993	----------	----------
18	COLD TEST	79.15	.64100138	.00024346	4.20316961	.07542653
19	WARM TEST	295.15	.89160414	.00024532	----------	----------
20	COLD TEST	79.15	.64162003	.00026197	4.21402479	.01603319

CH. 3 .79.6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.20224674506

NOISE POWER STABILITY (K) = .0613088712732

NOISE POWER STABILITY DELTA (K) = .0683380808979

NPS_MAX (K) = .0843712757893 NPS_MIN (K) = .0160331948914

INTEGRATION TIME = .165

TEST DATA SHEET 11 (Sheet 2 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 28.0 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	4	10.02	204.6	22.0	1.365	.000225	-194.0	0.9919	.000338
				22.0	1.366	.000255	-194.0	0.9926	.000296
				22.0	1.365	.000251	-194.0	0.9915	.000308
				22.0	1.365	.000273	-194.0	0.9919	.000309
				22.0	1.366	.000236 ~~.000236~~ T. Trinh	-194.0	0.9914	.000313
				22.0	1.366	.000235	-194.0	0.9915	.000273
				22.0	1.365	.000253	-194.0	0.9912	.000330
				22.0	1.365	.000247	-194.0	0.9911	.000302
				22.0	1.366	.000235	-194.0	0.9939	.000311
				22.0	1.366	.000238	-194.0	0.9916	.000299
Mixer/ Amps	All	10.02	173.2						

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

Quality Assurance: Roman QA 197 5-21-99

Date: 5/21/99

TEST DATA SHEET 11 (Sheet 6 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 28.0 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
4		4.32				0.055			
		4.33				0.044			
		4.32				0.034			
		4.32				0.071			
		4.32				0.036			
		4.32				0.033			
		4.31				0.047			
		4.31				0.023			
		4.34				0.037			
		4.32				0.030			
	4.95		4.32	P	0.08		0.041	0.048	P

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

Quality Assurance: [signature]

Date: 5/21/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-2 F06 ATP CHANNEL 4. TB 28 5/28/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	1.36538389	.00022450	----------	----------
2	COLD TEST	79.15	.99186660	.00033760	4.32157882	.05487636
3	WARM TEST	295.15	1.36551156	.00025506	----------	----------
4	COLD TEST	79.15	.99259951	.00029569	4.32907672	.04350990
5	WARM TEST	295.15	1.36532958	.00025076	----------	----------
6	COLD TEST	79.15	.99148861	.00030768	4.31761838	.03409498
7	WARM TEST	295.15	1.36532241	.00027320	----------	----------
8	COLD TEST	79.15	.99189657	.00030868	4.32245237	.07140882
9	WARM TEST	295.15	1.36550962	.00023587	----------	----------
10	COLD TEST	79.15	.99144616	.00031306	4.31559387	.03550666
11	WARM TEST	295.15	1.36551931	.00023483	----------	----------
12	COLD TEST	79.15	.99145885	.00027324	4.31565999	.03773120
13	WARM TEST	295.15	1.36531625	.00025275	----------	----------
14	COLD TEST	79.15	.99117136	.00033007	4.31402326	.03866694
15	WARM TEST	295.15	1.36535305	.00024699	----------	----------
16	COLD TEST	79.15	.99113879	.00030198	4.31333064	.02311716
17	WARM TEST	295.15	1.36551419	.00023522	----------	----------
18	COLD TEST	79.15	.99391052	.00031104	4.34444927	.03715632
19	WARM TEST	295.15	1.36562428	.00023831	----------	----------
20	COLD TEST	79.15	.99159807	.00029946	4.31639629	.02962834

CH. 4 .190.2 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.3210273587

NOISE POWER STABILITY (K) = .0405696677012

NOISE POWER STABILITY DELTA (K) = .0482916579679

NPS_MAX (K) = .0714088170789 NPS_MIN (K) = .023117159111

INTEGRATION TIME = .165

TEST DATA SHEET 11 (Sheet 3 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 28.0 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	5	10.0	184.0	22.0	1.302	.000249	-194.0	0.9348	.000235
				22.0	1.302	.000246	-194.0	0.9379	.000310
				22.0	1.303	.000222	-194.0	0.9358	.000337
				22.0	1.302	.000224	-194.0	0.9340	.000334
				22.0	1.303	.000214	-194.0	0.9340	.000290
				22.0	1.303	.000240	-194.0	0.9343	.000302
				22.0	1.303	.000248	-194.0	0.9355	.000284
				22.0	1.303	.000232	-194.0	0.9342	.000270
				22.0	1.303	.000253	-194.0	0.9378	.000242
				22.0	1.303	.000224	-194.0	0.9350	.000293
Mixer/ Amps	All	10.02	173.2						

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

Quality Assurance: [signature] 5-21-99

Date: 5/21/99

TEST DATA SHEET 11 (Sheet 7 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: Y. Trinh (Signature) Baseplate Temperature (T_B) 28.0 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
5		4.19				0.017			
		4.22				0.014			
		4.20				0.063			
		4.17				0.061			
		4.17				0.072			
		4.18				0.035			
		4.19				0.0089			
		4.18				0.049			
		4.22				0.033			
		4.18				0.061			
	5.1		4.19	P	0.08		0.042	0.063	P

Pass = P, Fail = F

Part No.: 1356409-1
Serial No.: F06

Test Engineer: Y. Trinh
Quality Assurance: Roman 5-21-99
Date: 5/21/99

AMSU-A TEST

A1-2 F06 ATP CHANNEL 5, TB 28 5/21/99 **FOR REFERENCE ONLY**

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	1.30180039	.00024874	----------	----------
2	COLD TEST	79.15	.93482949	.00028500	4.19039732	.01745646
3	WARM TEST	295.15	1.30225958	.00024592	----------	----------
4	COLD TEST	79.15	.93792806	.00031007	4.22349942	.01401925
5	WARM TEST	295.15	1.30257951	.00022239	----------	----------
6	COLD TEST	79.15	.93584964	.00033705	4.19588607	.06345461
7	WARM TEST	295.15	1.30246583	.00022375	----------	----------
8	COLD TEST	79.15	.93397190	.00033371	4.17452276	.06144668
9	WARM TEST	295.15	1.30256202	.00021439	----------	----------
10	COLD TEST	79.15	.93379664	.00029024	4.17162583	.07197885
11	WARM TEST	295.15	1.30252310	.00023997	----------	----------
12	COLD TEST	79.15	.93432941	.00030163	4.17827899	.03458162
13	WARM TEST	295.15	1.30252954	.00024756	----------	----------
14	COLD TEST	79.15	.93552448	.00029407	4.19243857	.00885746
15	WARM TEST	295.15	1.30262326	.00023238	----------	----------
16	COLD TEST	79.15	.93424892	.00026968	4.17647047	.04928673
17	WARM TEST	295.15	1.30262488	.00025344	----------	----------
18	COLD TEST	79.15	.93776945	.00024205	4.21844300	.03331024
19	WARM TEST	295.15	1.30263354	.00022402	----------	----------
20	COLD TEST	79.15	.93495216	.00029286	4.18473771	.06128982

CH. 5 ,168.4 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.19066336033

NOISE POWER STABILITY (K) = .041568172315

NOISE POWER STABILITY DELTA (K) = .0631213952053

NPS_MAX (K) = .071978854047 NPS_MIN (K) = .00885745884163

INTEGRATION TIME = .165

TEST DATA SHEET 11 (Sheet 4 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: Y. Trinh (Signature)   Baseplate Temperature (T_B) 28.0 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	8	9.99	187.0	22.0	1.401	.000278	-194.0	1.049	.000265
				22.0	1.400	.000308	-194.0	1.042	.000336
				22.0	1.400	.000269	-194.0	1.038	.000248
				22.0	1.399	.000320	-194.0	1.036	.000394
				22.0	1.399	.000295	-194.0	1.037	.000341
				22.0	1.399	.000309	-194.0	1.034	.000327
				22.0	1.398	.000281	-194.0	1.035	.000442
				22.0	1.399	.000286	-194.0	1.034	.000307
				22.0	1.399	.000285	-194.0	1.034	.000359
				22.0	1.399	.000319	-194.0	1.034	.000369
Mixer/ Amps	All	10.02	173.2						

Part No.: 1356409-1
Serial No.: F06

Test Engineer: Y. Trinh
Quality Assurance: Roman 5-21-99
Date: 5/21/99

TEST DATA SHEET 11 (Sheet 8 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 28.0 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
8		4.69				0.017			
		4.62				0.082			
		4.57				0.039			
		4.55				0.095			
		4.56				0.062			
		4.53				0.081			
		4.54				0.031			
		4.53				0.044			
		4.53				0.042			
		4.53				0.094			
	5.0		4.57	P	0.08		0.059	0.078	P

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

Quality Assurance:

Date: 5/21/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-2 F06 ATP CHANNEL 8, TB 28 5/28/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	1.40081908	.00027825	----------	----------
2	COLD TEST	79.15	1.04877835	.00026464	4.69234814	.01727865
3	WARM TEST	295.15	1.40028011	.00030837	----------	----------
4	COLD TEST	79.15	1.04239357	.00033579	4.61870734	.08214577
5	WARM TEST	295.15	1.39978803	.00026870	----------	----------
6	COLD TEST	79.15	1.03761508	.00024813	4.56514604	.03919094
7	WARM TEST	295.15	1.39943119	.00031970	----------	----------
8	COLD TEST	79.15	1.03611638	.00039374	4.55027598	.09536335
9	WARM TEST	295.15	1.39936886	.00029515	----------	----------
10	COLD TEST	79.15	1.03704348	.00034117	4.56199846	.06150175
11	WARM TEST	295.15	1.39893405	.00030870	----------	----------
12	COLD TEST	79.15	1.03439599	.00032669	4.53403442	.08140539
13	WARM TEST	295.15	1.39848400	.00028134	----------	----------
14	COLD TEST	79.15	1.03468834	.00044234	4.54153724	.03130435
15	WARM TEST	295.15	1.39871334	.00028604	----------	----------
16	COLD TEST	79.15	1.03380100	.00030702	4.52886029	.04357127
17	WARM TEST	295.15	1.39851146	.00028526	----------	----------
18	COLD TEST	79.15	1.03378615	.00035903	4.53046990	.04186324
19	WARM TEST	295.15	1.39889425	.00031888	----------	----------
20	COLD TEST	79.15	1.03366051	.00036931	4.52557814	.09400389

CH. 8 ,155.2 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.56518394874

NOISE POWER STABILITY (K) = .0587628595906

NOISE POWER STABILITY DELTA (K) = .0780847062878

NPS_MAX (K) = .095363352111 NPS_MIN (K) = .0172786458232

INTEGRATION TIME = .165

TEST DATA SHEET 17
Temperature Sensor and Thermistor Test Data (Paragraph 3.6.1) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 22.0 °C

Reference Designation	Specification	Measured Value	Pass/Fail
RT 41	2200 ± 100 Ω	2,177 Ω	P
RT 42	2200 ± 100 Ω	2,175 Ω	P
RT 43	2200 ± 100 Ω	2,170 Ω	P
RT 44	2200 ± 100 Ω	2,175 Ω	P
RT 12	2200 ± 100 Ω	2,176 Ω	P
RT 17	2200 ± 100 Ω	2,176 Ω	P
RT 18	2200 ± 100 Ω	2,175 Ω	P
RT 19	2200 ± 100 Ω	2,176 Ω	P
RT 22	2200 ± 100 Ω	2,175 Ω	P
RT 33	2200 ± 100 Ω	2,170 Ω	P
TB 58	3000 ± 100 Ω	2,999 Ω	P
TB 59	3000 ± 100 Ω	3,003 Ω	P
TB 54	4.1 – 4.6 V	4.35 V	P

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

Quality Assurance: [signature] 5-21-99

Date: 5/21/99

TEST DATA SHEET 20

Survival Heater and Thermal Switch Test Data (Paragraph 3.6.2) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 22.0 °C

Reference Designation	Open Switch		Closed Switch		
	>10 MΩ	Pass/Fail	Specification	Measured Value	Pass/Fail
HR1/TS1	750MΩ	P	40 - 48 Ω	44.37	P
	750MΩ	P		44.70	P
HR2/TS2	750MΩ	P		44.63	P
	750MΩ	P		44.77	P

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

Quality Assurance: [signature] 74 197 5/21/99

Date: 5/21/99

TEST DATA SHEET 22 (Sheet 2 of 3)
Bias Voltage Verification Test Data (Paragraph 3.6.3) (A1-2)

Test Setup Verified: Y. Yin (Signature) Baseplate Temperature (T_B) 23.0 °C

Reference Designation	Specification	Measured Value (V)	Pass/Fail
Mixer/IF AMP Ch 3, 4, 5, 8	+10 ±0.1	10.01	P
DRO Ch 5	+10 ±0.1	9.99	P
DRO Ch 4	+10 ±0.1	10.01	P
DRO Ch 3	+10 ±0.1	9.96	P
DRO Ch 8	+10 ±0.1	9.98	P

Part No.: 1356409-1
Serial No.: F06

Test Engineer: Y. Yin
Quality Assurance: [signature] QA 197 5-21-99
Date: 5/21/99

Report No. 11491
June 1999

TEST DATA

FOR

AMSU-A1-1 (P/N: 1356429-1, S/N: F06)

TEST DATA SHEET 2
LO Frequency Test Data (Paragraph 3.5.1) (A1-2)

Test Setup Verified: Y. Trinh
Signature

Baseplate Temperature (T_B) 26.0 °C

Component	Channel No.	V_b(V)	I_b(mA)	P_{dc}(mW) Required (Max)	P_{dc}(mW) Measured	P_{dc}(mW) Pass/Fail	f_o(GHz) Required	f_o(GHz) Measured	f_o(GHz) Pass/Fail
LO	3	9.97	186.8	2,700	1862.4	P	50.300 ± 0.008	50.300883	P
	4	10.02	204.5	2,700	2049.1	P	52.800 ± 0.003	52.800554	P
	5	10.0	183.8	2,700	1838.0	P	53.596 ± 0.003	53.595868	P
	8	9.99	186.8	2,700	1866.1	P	55.500 ± 0.008	55.500665	P
Mixer/Amps	All	10.02	173.2	1,800	1735.5				
TOTAL				12,600	9351.1				

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F06

Test Engineer: Y. Trinh

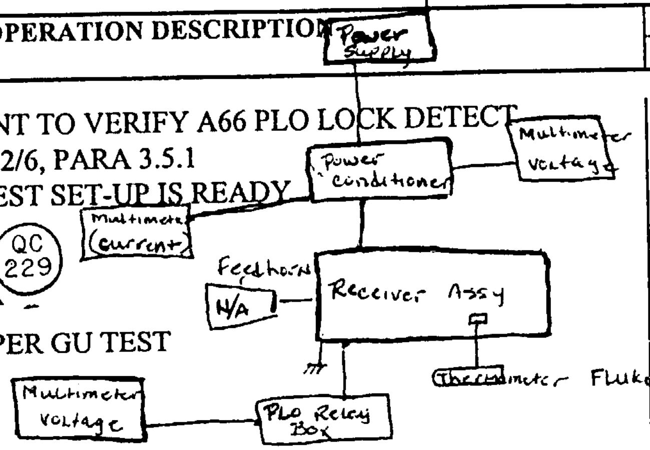
Quality Assurance: [signature] 5/21/99

Date: 5/21/99

SHOP ORDER AMENDMENT # 1

SHOP ORDER NUMBER	SPLIT REFERENCE	PART DESCRIPTION	PART NUMBER	DWG REV	PLN REV
732423		A1-1 RECEIVER ASSEMBLY	1356429-3	*	00

BARCODE / OPERATION NUMBER	WORK CENTER	OPERATION DESCRIPTION	STAMP PROD	STAMP INSP	SETUP / RUN TIME	IR's/EQCR's/TAR's/TRR' COMMENTS
8032000	TEST 7ATTS	A SET UP TEST EQUIPMENT TO VERIFY A66 PLO LOCK DETECT VOLTAGE PER AE-26002/6, PARA 3.5.1 B NOTIFY INSPECTION TEST SET-UP IS READY QC 229 6/14/99	6-11-99 MFG 188 6/11/99		JUN 11 '99	6/14/99 QC 229 Locked 101256
8034000	INSP 7CISM	INSPECT TEST SET UP PER GU TEST AND FIGURE SHOWN. QC 229 6/14/99		7A 268		
8036000	TEST 7ATTS	PERFORM DELTA TRR PER P.D NO 76A AND ATTACH SIGNED CERT TO S/O	6/14/99			
8038000	TEST 7ATTS	A NOTIFY INSPECTION OF START OF TEST B VERIFY PLO LOCK VOLTAGE ONLY PER AE 26002/6 PARA 3.5.1 STEP 16 RECORD PLO #2 LOCK VOLTAGE 13.67 V ~~C ATTACH ENGINEERING DATA TO S/O~~ QC 229 6/11/99	6/11/99 6/14/99	7A 268	JUN 11 '99	
8040000	INSP 7CISM	MONITOR TEST OP 8038 RETURN TO op. 8031 FOR DCMC INSPECTION. QC 229 6/14/99 RETURN TO S/O OPER ~~00104~~ 0555.		7A 268		6-11-99



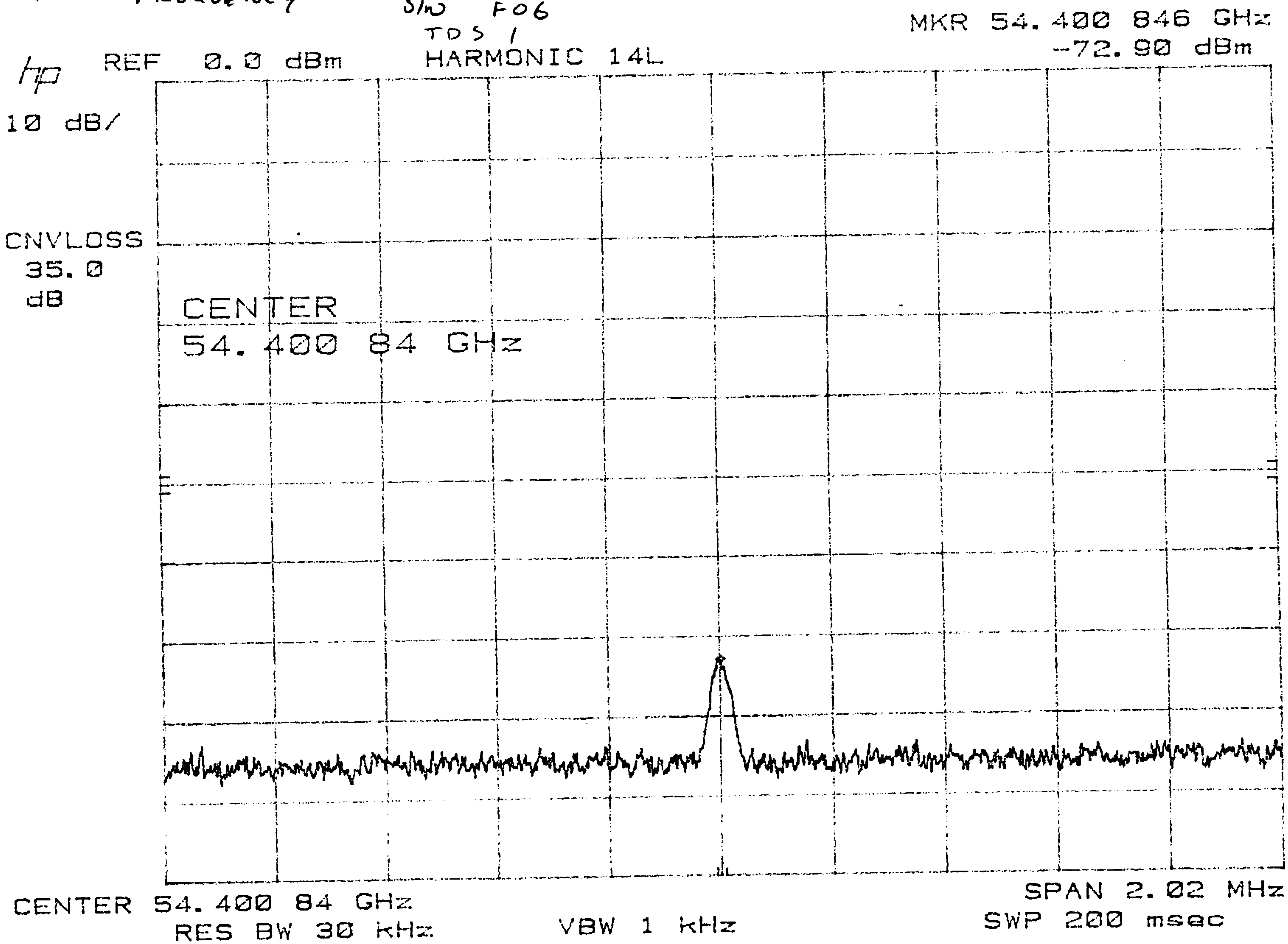
FOR REFERENCE [illegible]

ch. 6 FREQUENCY

P/N 1356429 C

S/N F06

TDS 1



ch. 7 FREQUENCY

P/N: 1356429-2
S/N: F06
TOS 1

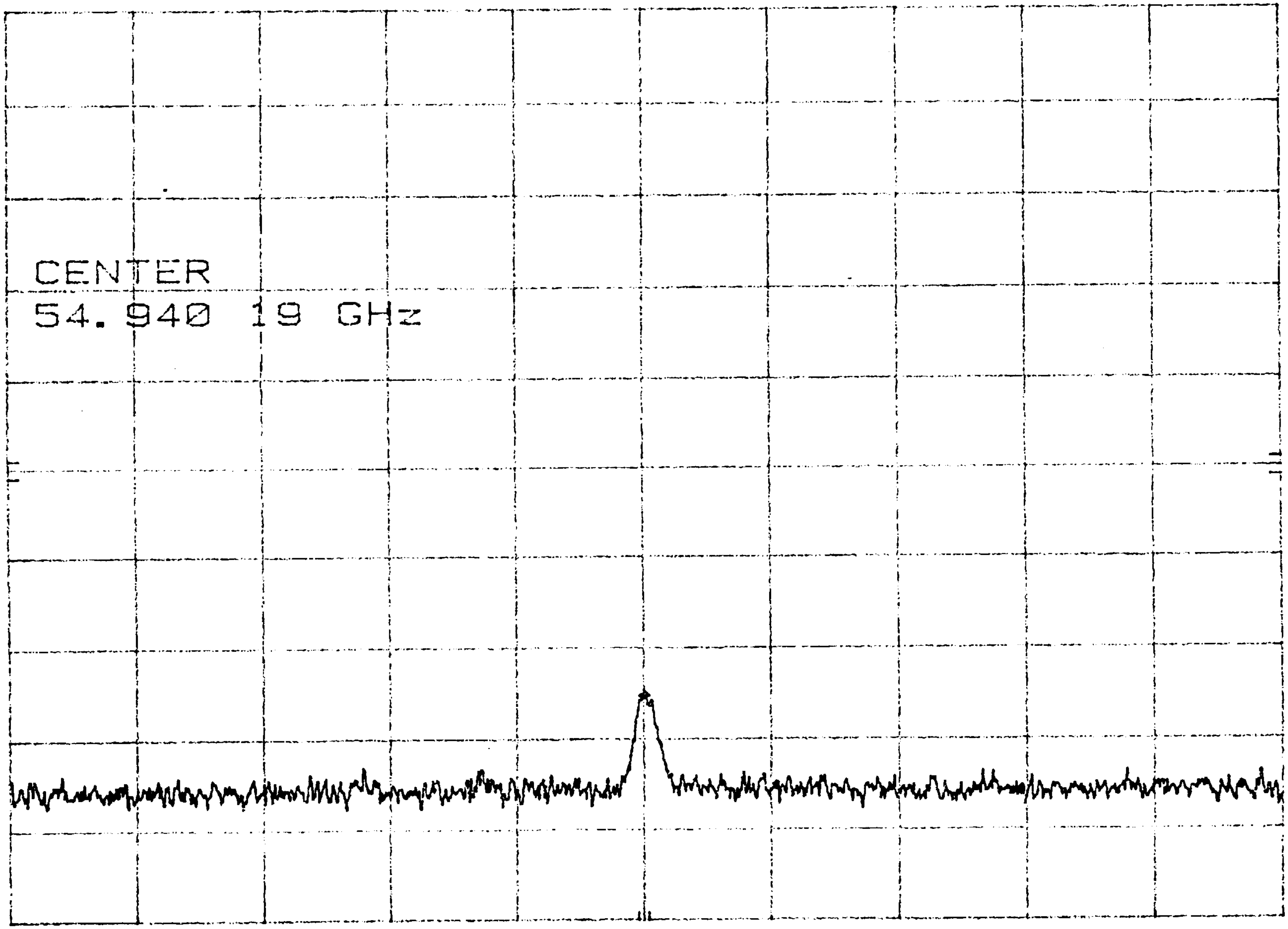
FOR REFERENCE ONLY

MKR 54.940 191 GHz
-75.20 dBm

hp REF 0.0 dBm HARMONIC 14L

10 dB/

CNVLOSS
35.0
dB



CENTER 54.940 19 GHz
RES BW 30 kHz

VBW 1 kHz

SPAN 2.01 MHz
SWP 200 msec

PLO #1 FREQUENCY

P/N: 1356429

S/N: F06

TOS 1

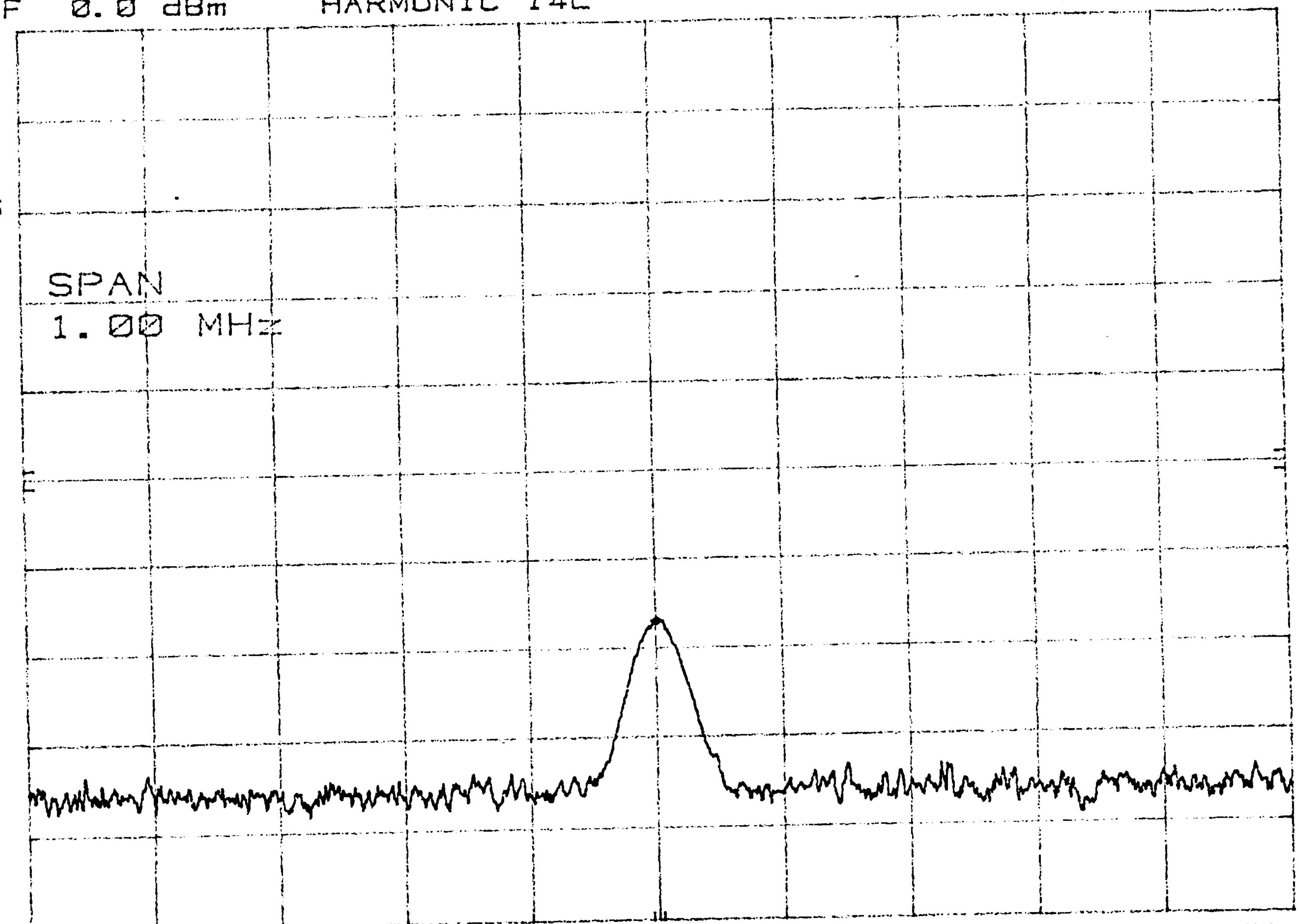
FOR REFERENCE ONLY

MKR 57.290 323 GHz
-67.00 dBm

hp REF 0.0 dBm HARMONIC 14L

10 dB/

CNVLOSS
35.0
dB



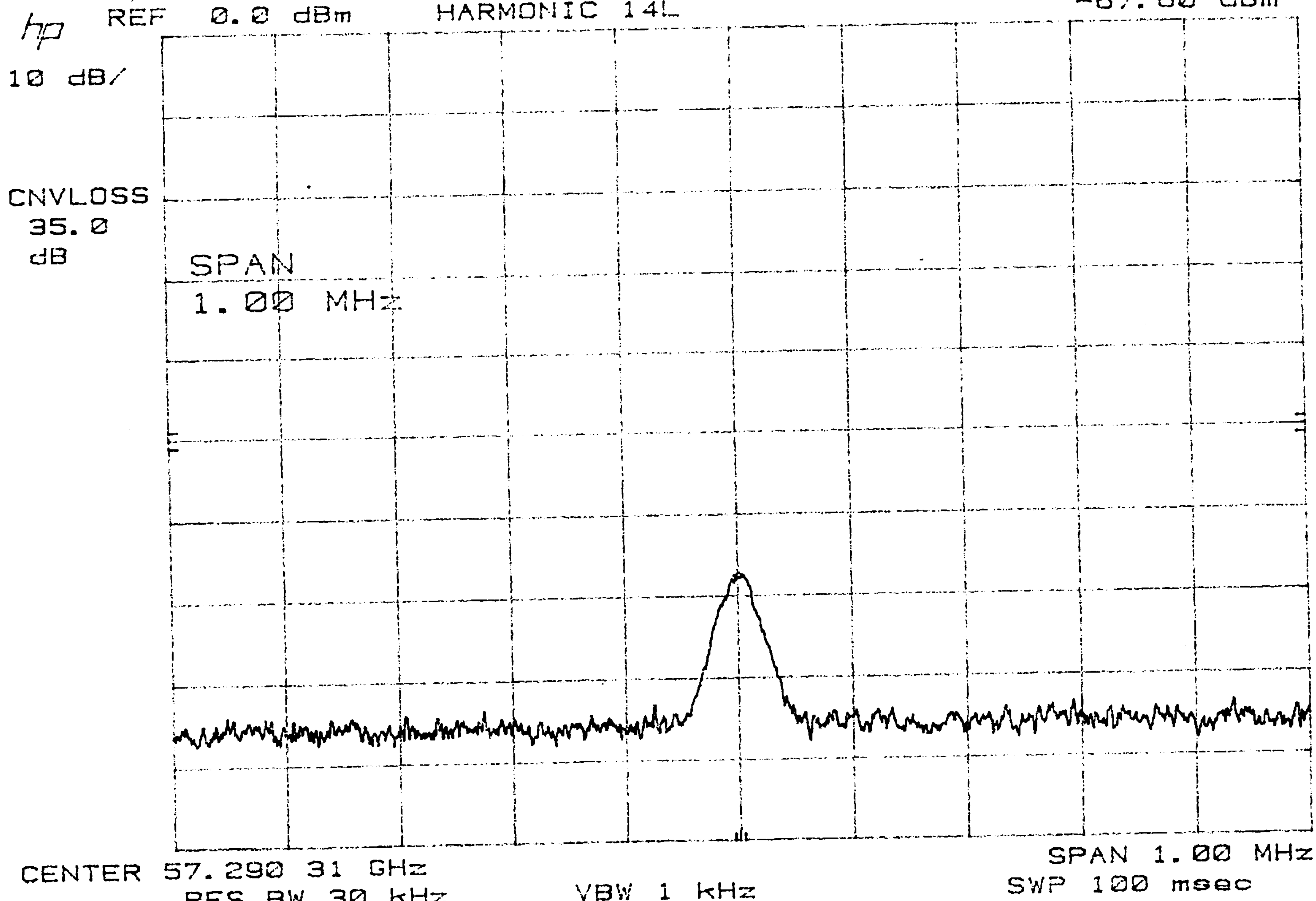
CENTER 57.290 32 GHz
RES BW 30 kHz

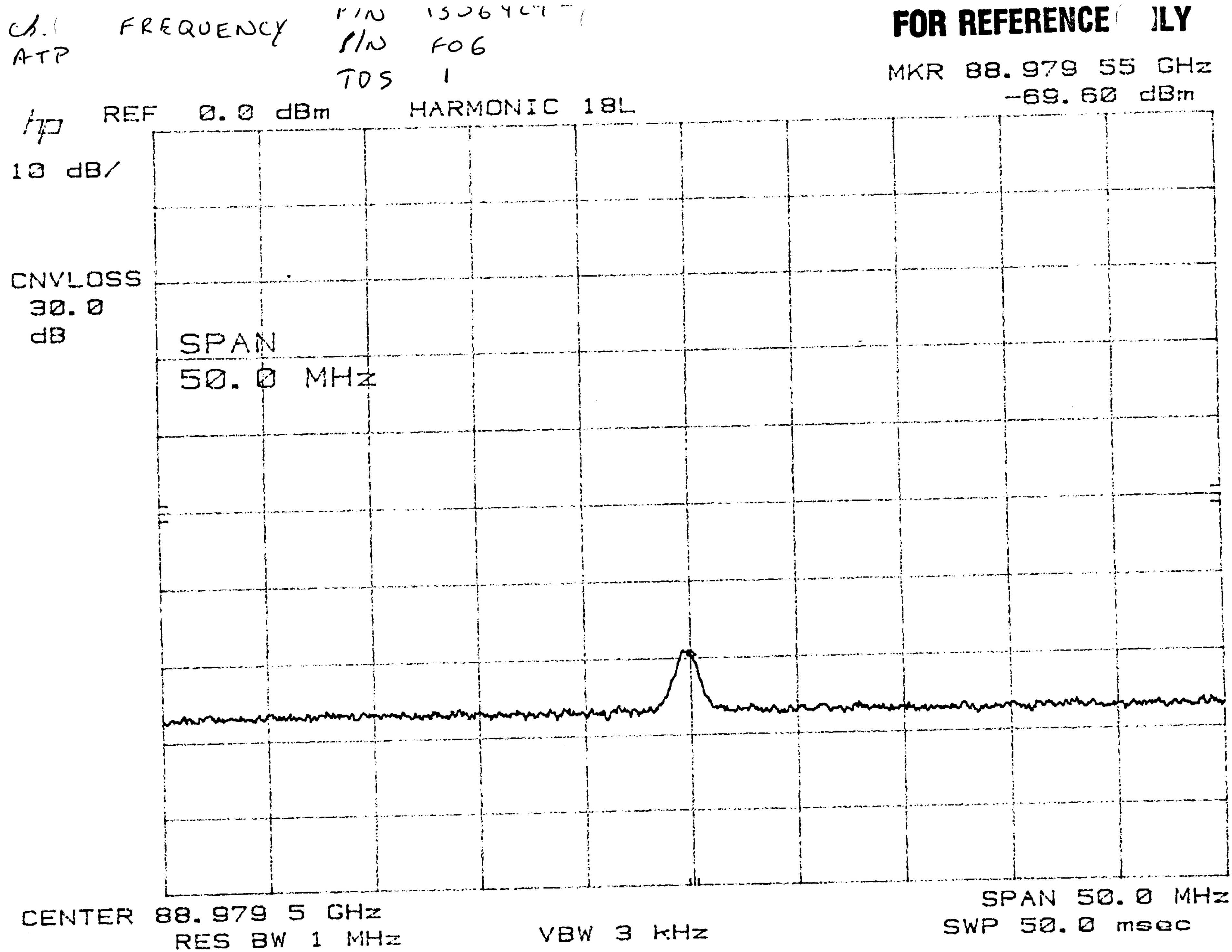
VBW 1 kHz

SPAN 1.00 MHz
SWP 100 msec

FOR REFERENCE ONLY

PLO #2 FREQUENCY P/N 1356929-2
S/N F06
TO S 1





FREQUENCY
ATP
P/N 1506404
S/N F06
TDS 1
FOR REFERENCE ONLY
MKR 88.979 55 GHz
-69.60 dBm
REF 0.0 dBm
HARMONIC 18L
10 dB/
CNVLOSS
30.0
dB
SPAN
50.0 MHz
CENTER 88.979 5 GHz
RES BW 1 MHz
VBW 3 kHz
SPAN 50.0 MHz
SWP 50.0 msec

TEST DATA SHEET 4

IF Output Power Test Data (Paragraph 3.5.2) (A1-1)

Test Setup Verified: [signature] Baseplate Temperature (T_B) 28 °C
Signature

Component	Channel No.		V_b(V)	I_b(mA)	P_o(dBm)	Atten (dB)	P_o(dBm) Required	P_o(dBm) Measured	Pass/Fail
LO	6		9.97	180.9	19.60	7	-27.0 ± 1.0	26.9	P
	7		9.93	176.9	19.50	7	-27.0 ± 1.0	26.8	P
	LO No. 1	9	Posi-		22.22	5	-27.0 ± 1.0	27.2	P
		10	tive	ce 5/28/99 ~~15.13~~	23.58	3	-27.0 ± 1.0	26.7	P
		11	15.13	529.5	21.08	6	-27.0 ± 1.0	27.0	P
		12	Nega-		21.06	6	-27.0 ± 1.0	27.0	P
		13	tive	ce 5/28/99 ~~15.13~~	21.76	5	-27.0 ± 1.0	26.8	P
		14	-15.13	-68.43	21.98	5	-27.0 ± 1.0	27.0	P
	LO No. 2	9	Posi-				-27.0 ± 1.0	27.2	P
		10	tive	689.8			-27.0 ± 1.0	26.7	P
		11	15.11				-27.0 ± 1.0	27.0	P
		12	Nega-				-27.0 ± 1.0	27.0	P
		13	tive				-27.0 ± 1.0	26.8	P
		14	-15.13	-67.44			-27.0 ± 1.0	27.0	P
	15		14.88	158.3	23.39	4 (-8)	-27.0 ± 1.0	27.4	P
Mixer/ Amps	All		9.93	249.1					
IF Amps	All		7.94	266.8					

Pass = P, Fail = F

SO # 622627

Part No.: 135629-2

Serial No.: F06

Test Engineer: [signature]

Quality Assurance: TA 200

Date: 6/1/99

TEST DATA SHEET 7 (Sheet 1 of 2)
Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-1)

Test Setup Verified: [signature] Baseplate Temperature (T_B) 29 °C
Signature

Component		Channel No.	V_b(V)	I_b(mA)	3 dB BW Frequency (MHz) Lower	3 dB BW Frequency (MHz) Higher	3 dB BW Frequency (MHz) Required MAX	3 dB BW Frequency (MHz) Measured	Pass/Fail
LO		6	9.96	181.0	8.0	201.0	200	193.0	P
		7	9.93	176.1	8.0	199.2	200	191.2	P
	LO	9	Positive		8.6	162.6	165	154.0	P
	No.	10			179.9	254.7	78	74.8	P
					256.5	291.6	36	35.1	P
	1	11	15.13	522.8	353.0	387.3	36	34.3	P
		12	Negative		292.5	308.0	16	15.5	P
					336.2	351.8	16	15.6	P
		13			308.4	316.2	8	7.8	P
					328.3	336.2	8	7.9	P
					316.3	319.3	3	3.0	P
		14	-15.13	-68.29	325.3	328.3	3	3.0	P
	LO	9	Positive		8.7	162.7	165	154	P
	No.	10			179.8	255.8	78	75.2	P
					256.5	291.6	36	35.1	P
	2	11	15.10	686.0	353.0	387.3	36	34.3	P
		12	Negative		292.5	308.0	16	15.5	P
					336.2	351.7	16	15.5	P
		13			308.3	316.2	8	7.9	P
					328.3	336.2	8	7.9	P
		14			316.3	319.3	3	3.0	P
			-15.13	-67.32	325.3	328.3	3	3.0	P
		15	14.88	158.35	498	1446	1000	948	P
Mixer/Amps		All							
IF Amps		All							

Part No.: 135429-2

Serial No.: F06

S/O # 622627

Test Engineer: [signature]

Quality Assurance: QA 200

Date: 6/1/99

TEST DATA SHEET 7 (Sheet 2 of 2)
Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-1)

Test Setup Verified: Gary Lamb Baseplate Temperature (T_B) 29.0 °C
Signature

Component		Channel No.	V_b(V)	I_b(mA)	40 dB BW Frequency (MHz) Lower	40 dB BW Frequency (MHz) Higher	40 dB BW Frequency (MHz) Required MAX (Ref Only)	40 dB BW Frequency (MHz) Measured	Pass/Fail
LO		6	9.97	180.98	2.30	220.0	520.	217.7	P
		7	9.93	176.0	2.30	220.8	520	218.5	P
	LO No. 1	9	Positive 15.13	688.06	2.9 ~~169.8~~	5/28/99 178.4	429	176.4	P
		10			169.8	264.6	101	94.8	P
		11			N/A	N/A	47	N/A	N/A
		12	Negative -15.13	-67.36	N/A	N/A	21	N/A	N/A
		13			N/A	N/A	10	N/A	N/A
		14			N/A	N/A	4 5/28/99	N/A	N/A
	LO No. 2	9	Positive 15.11	688.5 mA	2.0	178.8	429	~~N/A~~ 176.8	P
		10			169.9	264.4	101	94.5	P
		11			N/A	N/A	47	N/A	N/A
		12	Negative -15.13	-67.38 mA	N/A	N/A	21	N/A	N/A
		13			N/A	N/A	10	N/A	N/A
		14			N/A	N/A	4	N/A	N/A
		15	14.88	158.2	N/A	N/A	7800	N/A	N/A
Mixer/Amps		All							
IF Amps		All							

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: Gary Lamb
Quality Assurance: QA 200
Date: 5/28/99

S/O -2627 TDS 7
P/N 1356429-2
S/W FOG

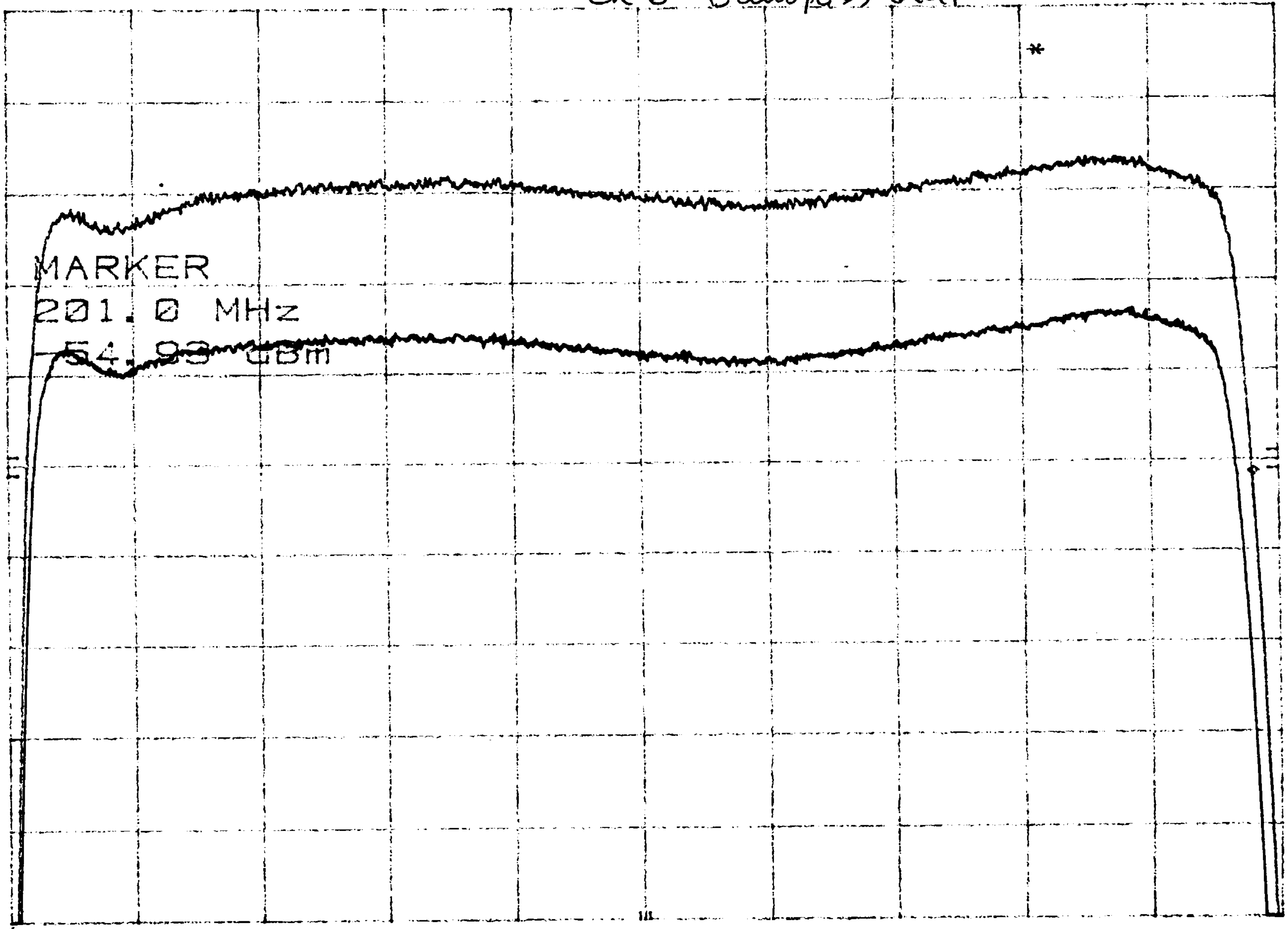
PLO#1

FOR REFERENCE ONLY

hp REF -49.8 dBm ATTEN 10 dB Ch 6 Bandpass char MKR 201.0 MHz -54.93 dBm

1 dB/

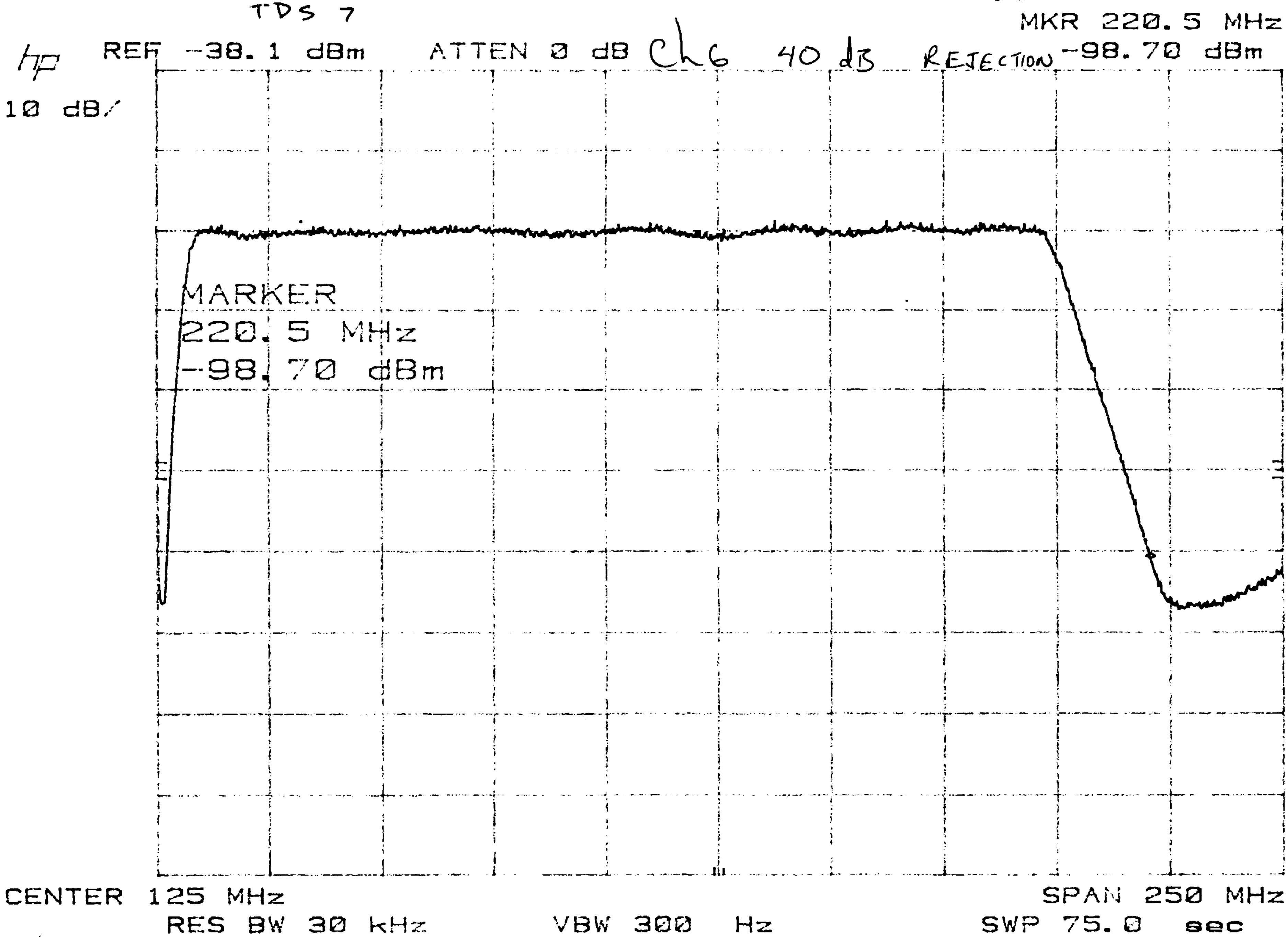
NF = 3.98



CENTER 105 MHz SPAN 200 MHz
RES BW 1 MHz VBW 30 Hz SWP 20.0 sec

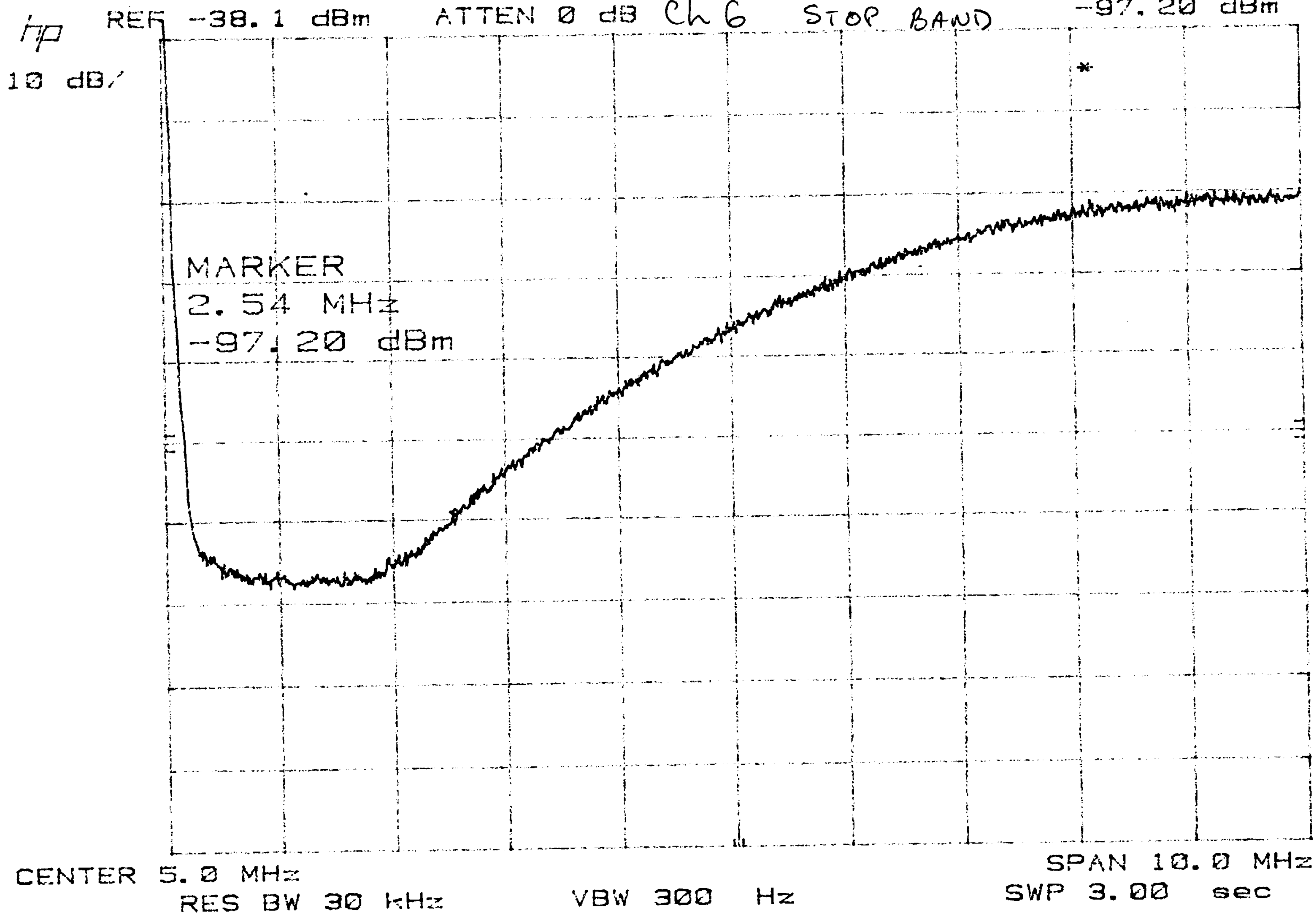
5/28/99 ch. 6 ATP P/N 1356429-2
S/N F06
TDS 7

FOR REFERENCE ONLY



P/N 1356429-2
S/N F06
5/28/99 Ch. 6 ATP
TDS 7

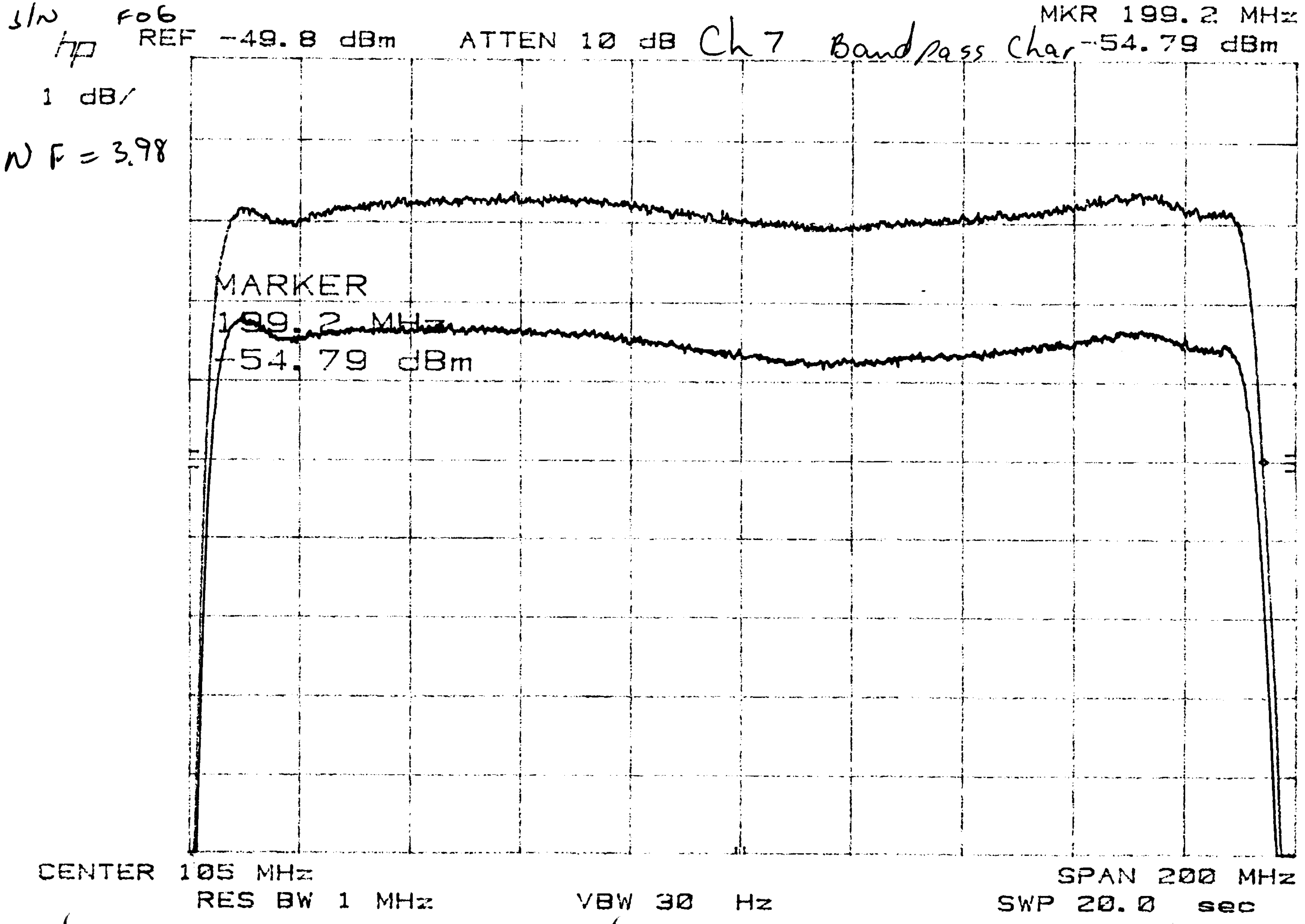
FOR REFERENCE ONLY



S/O 622627 TDS 7
P/N 1356429-2
S/N F06

PLO#1

FOR REFERENCE ONLY



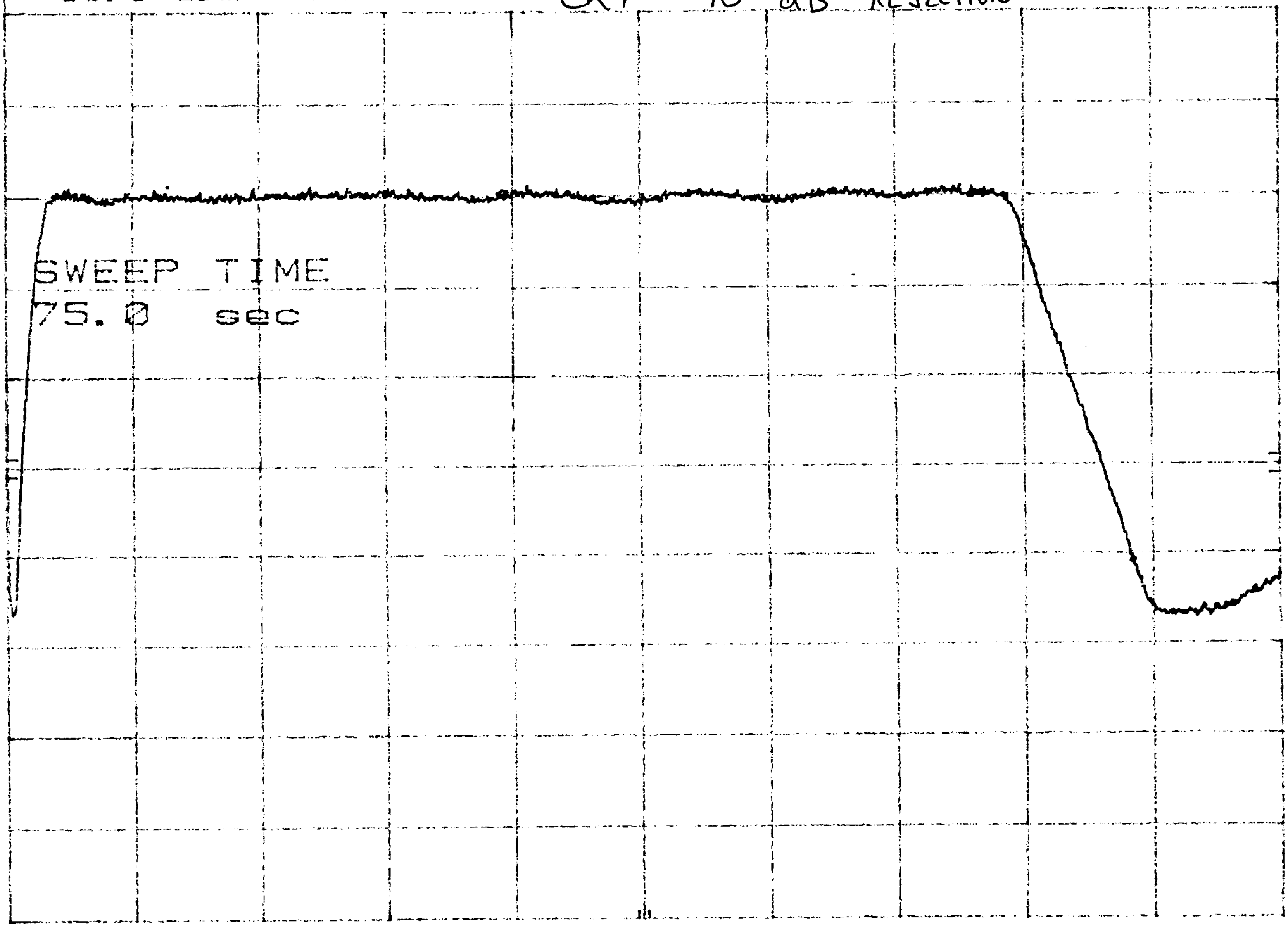
5/28/99 PN 1356429-2
ch.7 ATP S/N F06
TDS 7

FOR REFERENCE ONLY

MKR 97.8 MHz

hp REF -38.1 dBm ATTEN 0 dB ch7 40 dB REJECTION -57.80 dBm

10 dB/

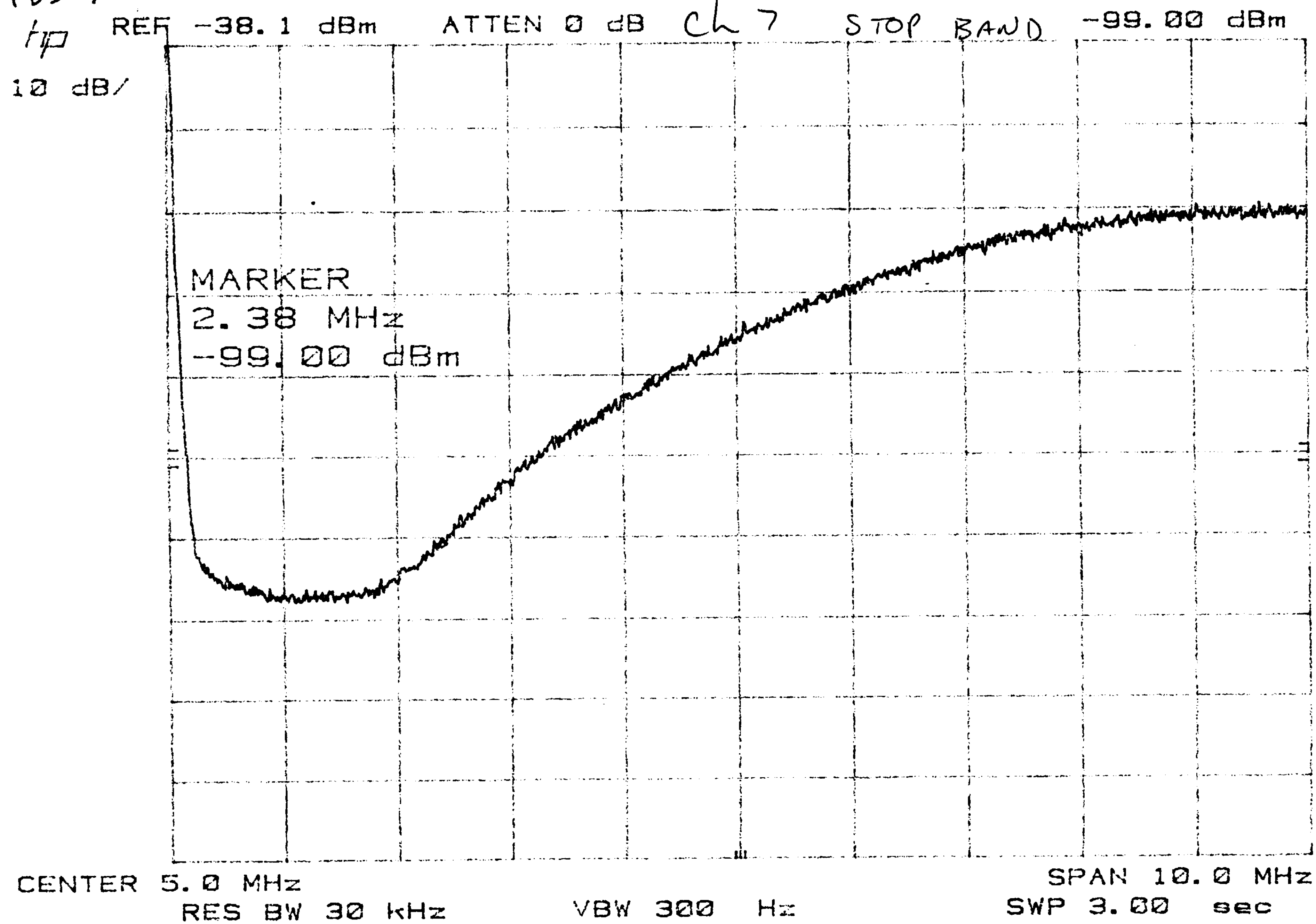


CENTER 125 MHz SPAN 250 MHz

RES BW 30 kHz VBW 300 Hz SWP 75.0 sec

P/N 155642I-C
S/N F06
5/28/99 ch. 7 ATP
TDS 7

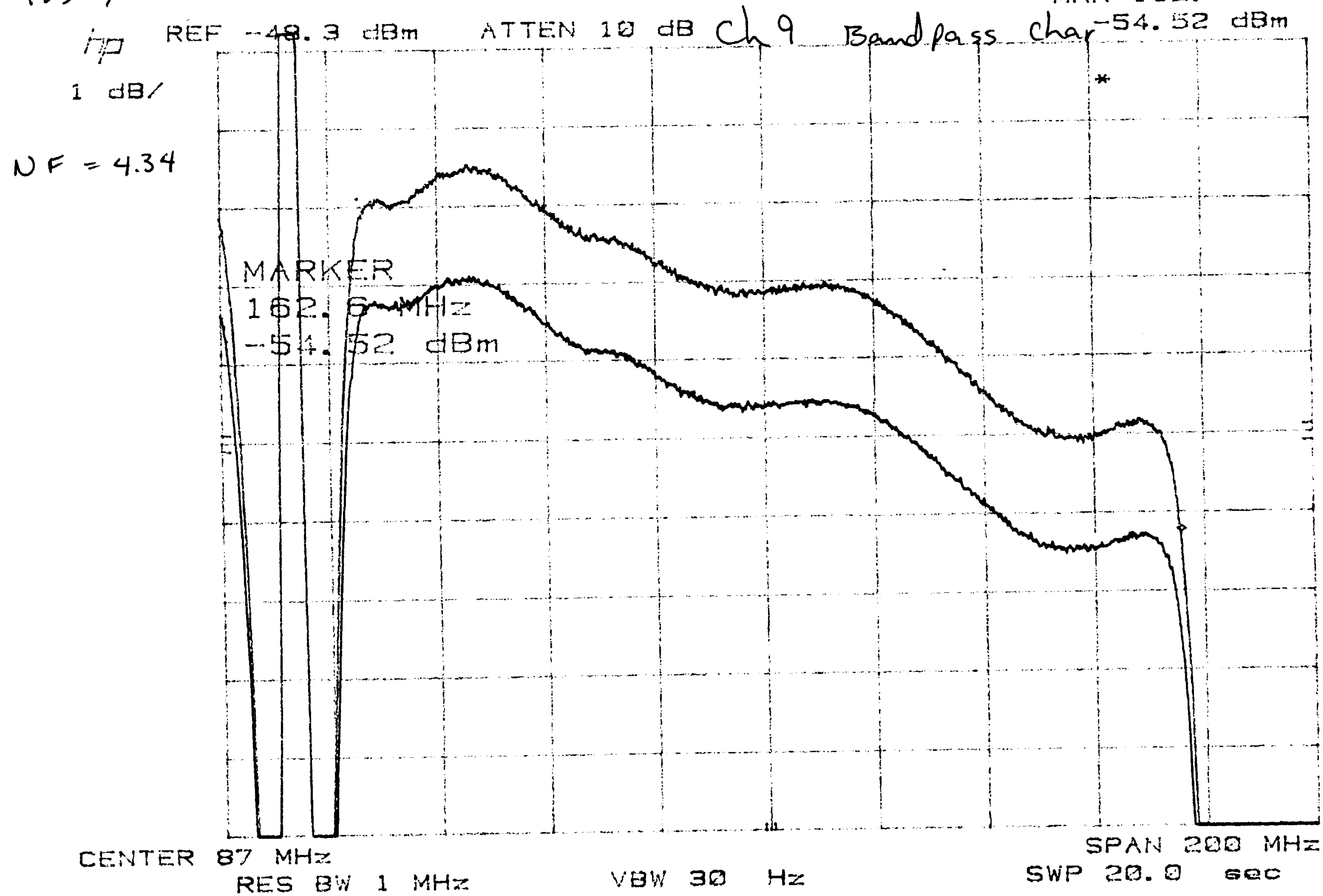
FOR REFERENCE ONLY



S/O 622627
P/N 1356429-2
TDS 7

PLO #1

FOR REFERENCE ONLY



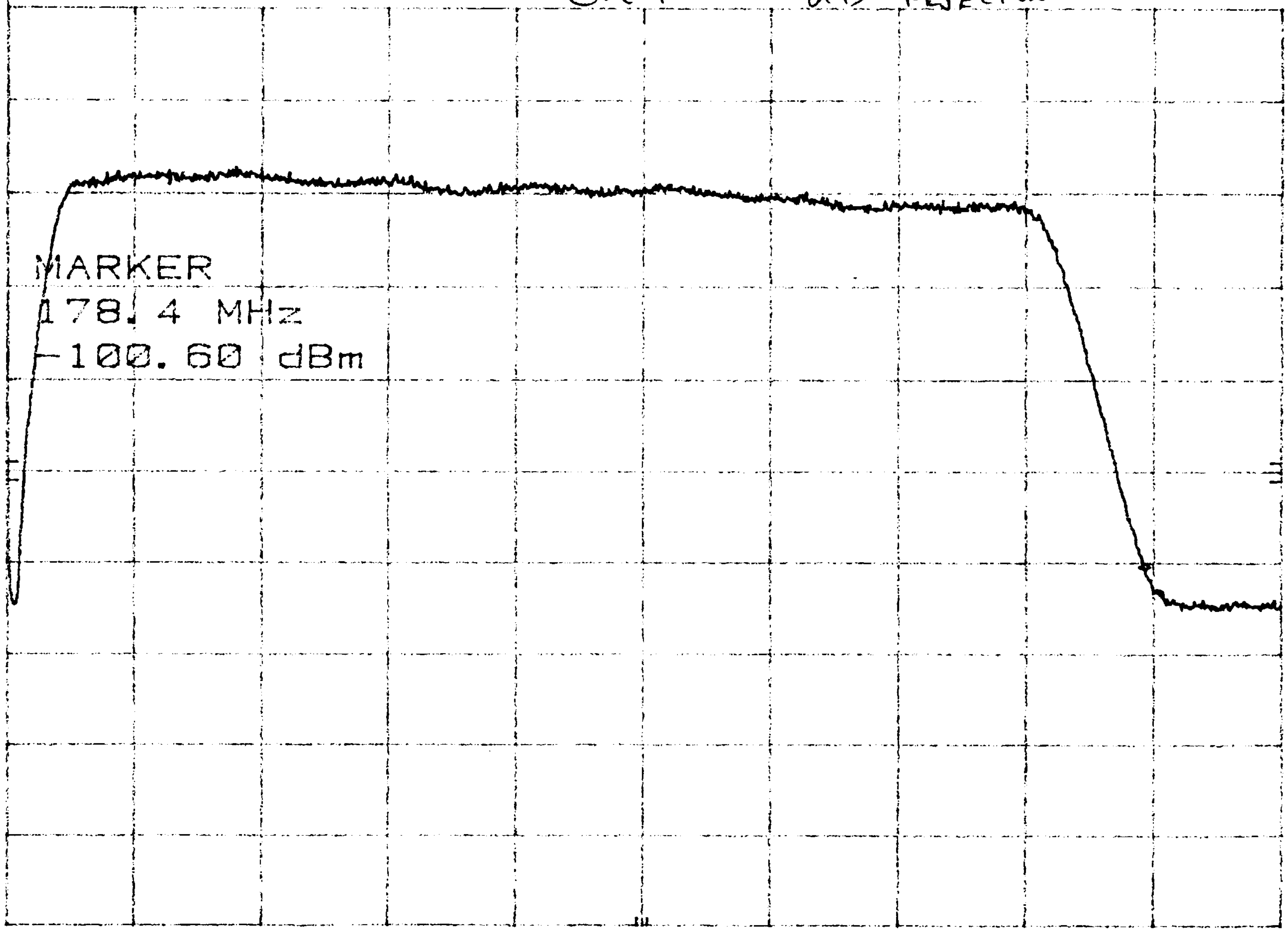
5/28/99 #11 P/N 1356427-2
PLO #1 Ch.9 S/N F06
TDS 7

FOR REFERENCE ONLY

MKR 178.4 MHz

hp REF -40.2 dBm ATTEN 0 dB Ch9 40 dB REJECTION 100.60 dBm

10 dB/



CENTER 100 MHz SPAN 200 MHz
RES BW 30 kHz VBW 300 Hz SWP 60.0 sec

PLO #1 ch. 9

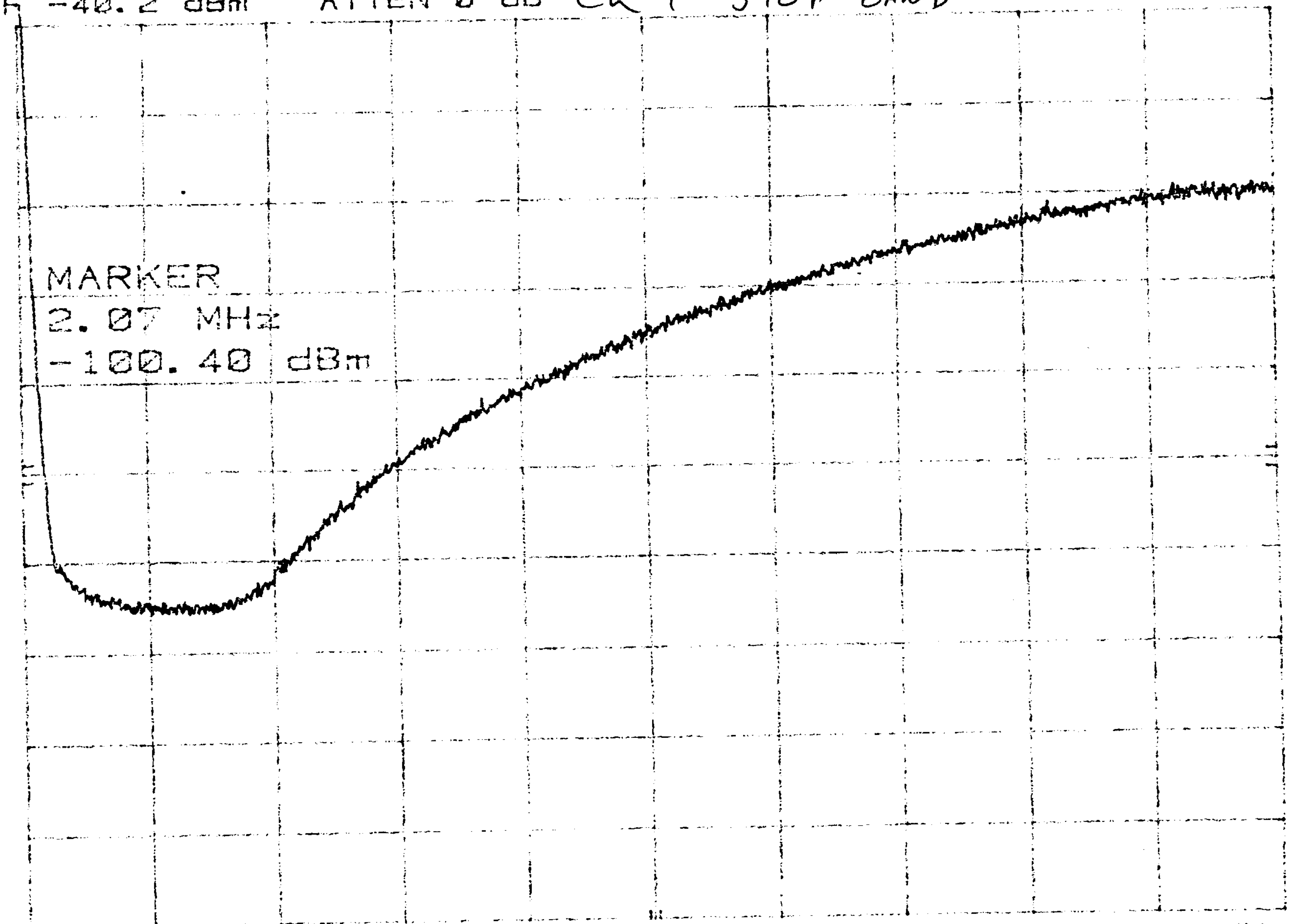
P/N 135 6427-2
S/N F06
TDS 7

FOR REFERENCE ONLY

MKR 2.07 MHz
-100.40 dBm

hp REF -40.2 dBm ATTEN 0 dB Ch 9 STOP BAND

10 dB/

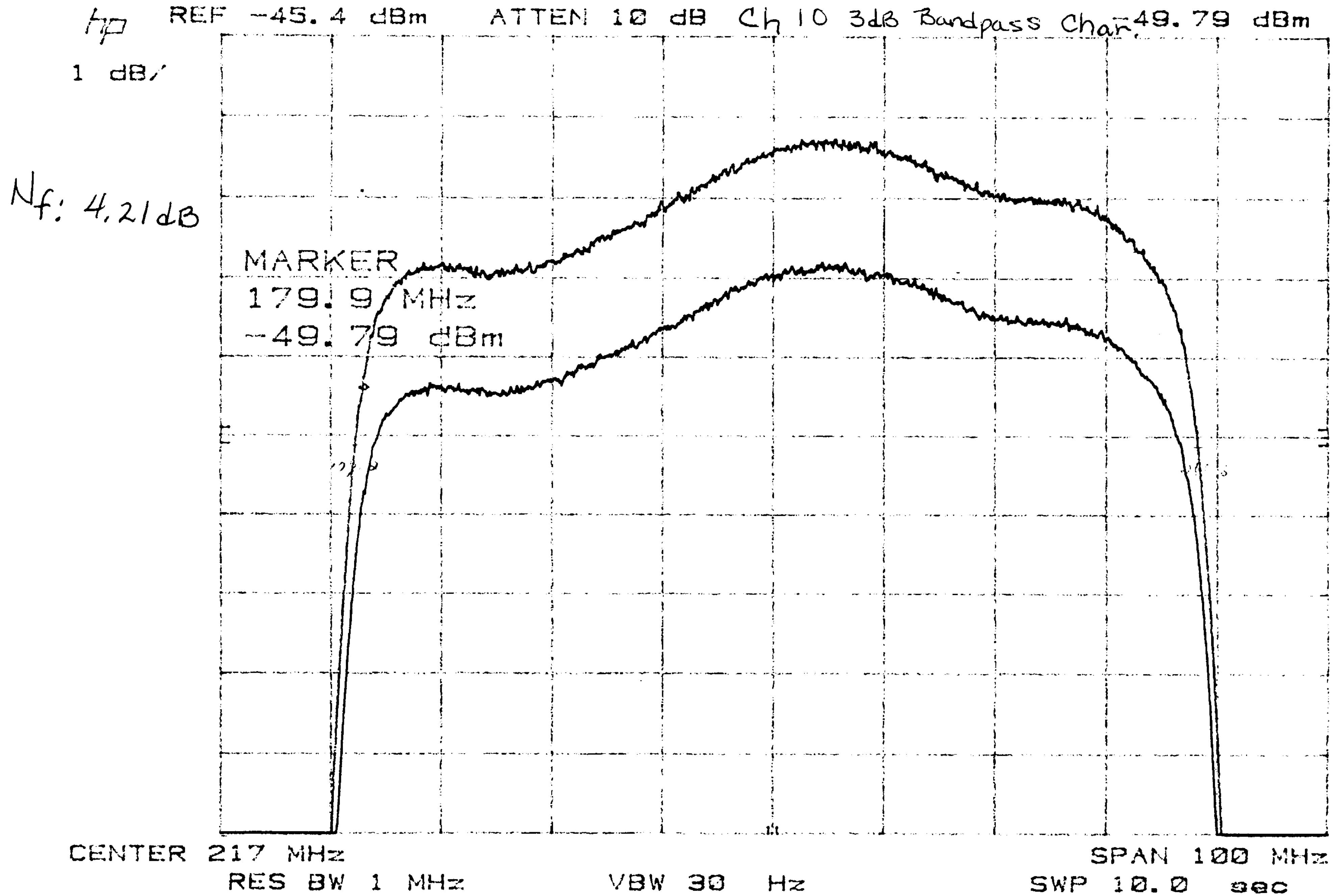


START 0 Hz
RES BW 30 kHz VBW 300 Hz
STOP 10.0 MHz
SWP 5.00 sec

S/C # 622627
P/N # 135649-2
TDS 7

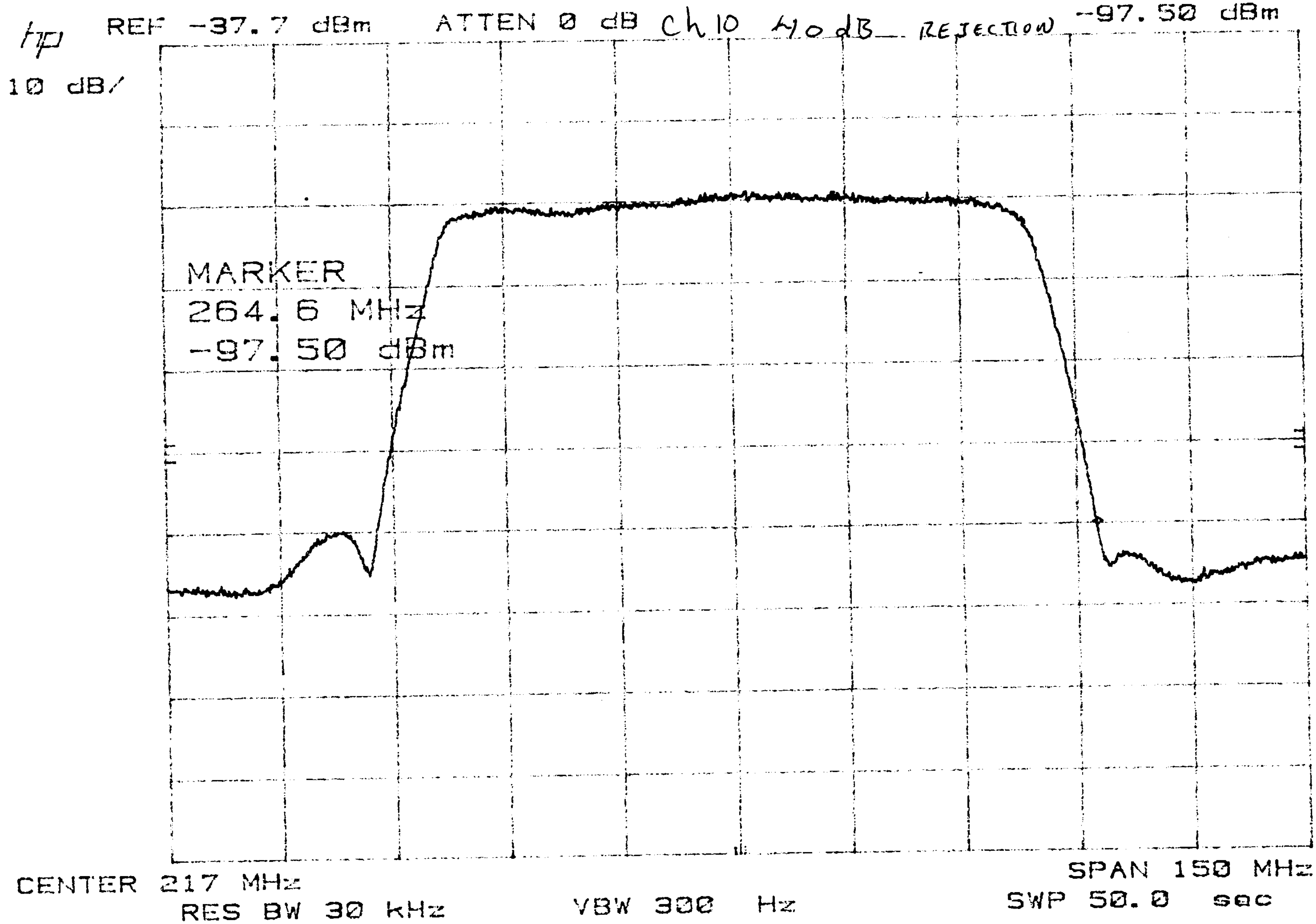
PLO#1

FOR REFERENCE ONLY



PLO #1 Ch. 10 P/N 13Ø6424-2
S/W FOC
TDS 7

FOR REFERENCE ONLY



S/O # 622627
P/N # 1354429-2
TDS 7

FOR REFERENCE ONLY

PL041

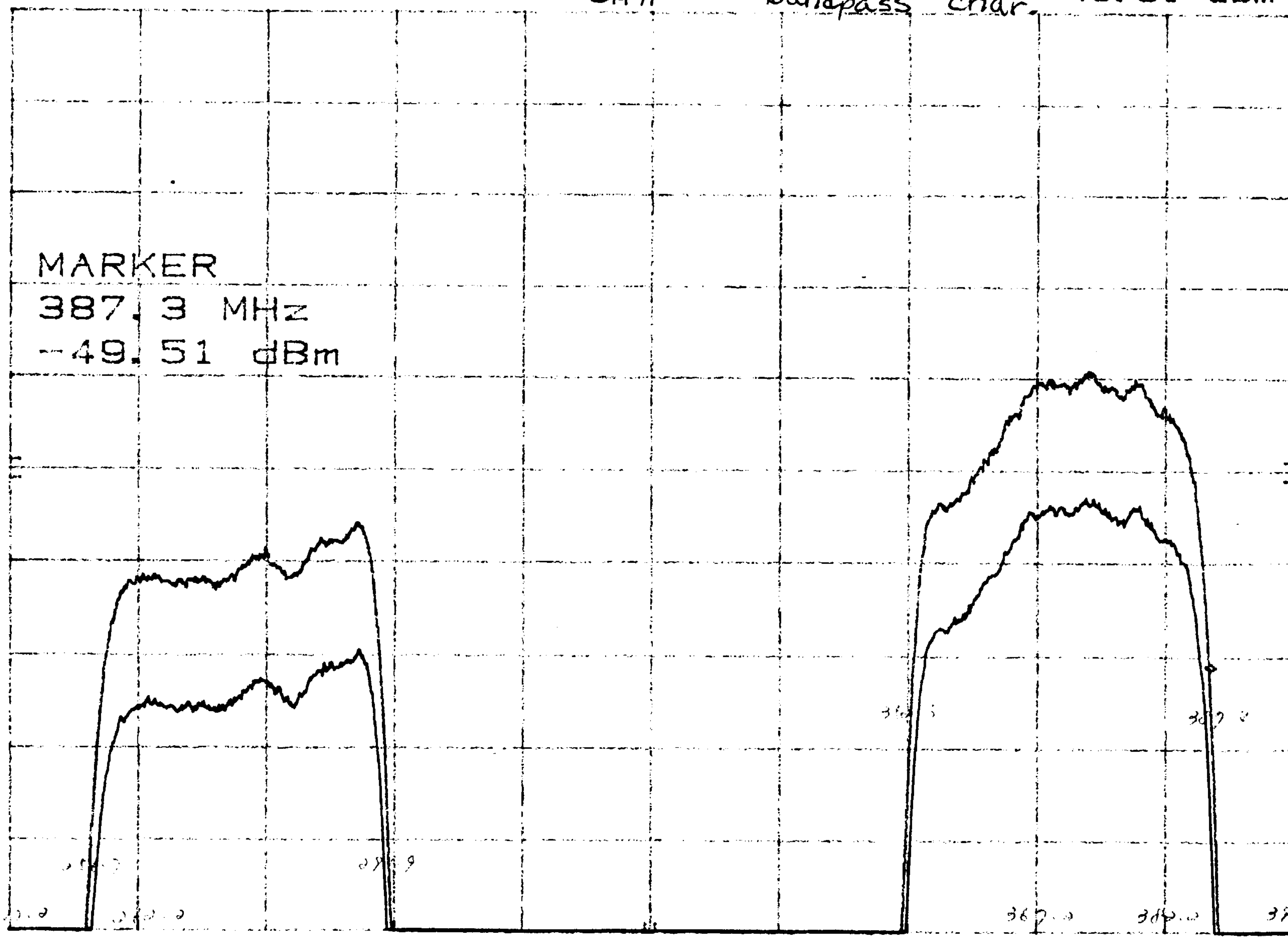
CH 11 3dB Bandpass Char.

hp REF -42.4 dBm ATTEN 10 dB

MKR 387.3 MHz
-49.51 dBm

1 dB/

Nf: 4.45 dB

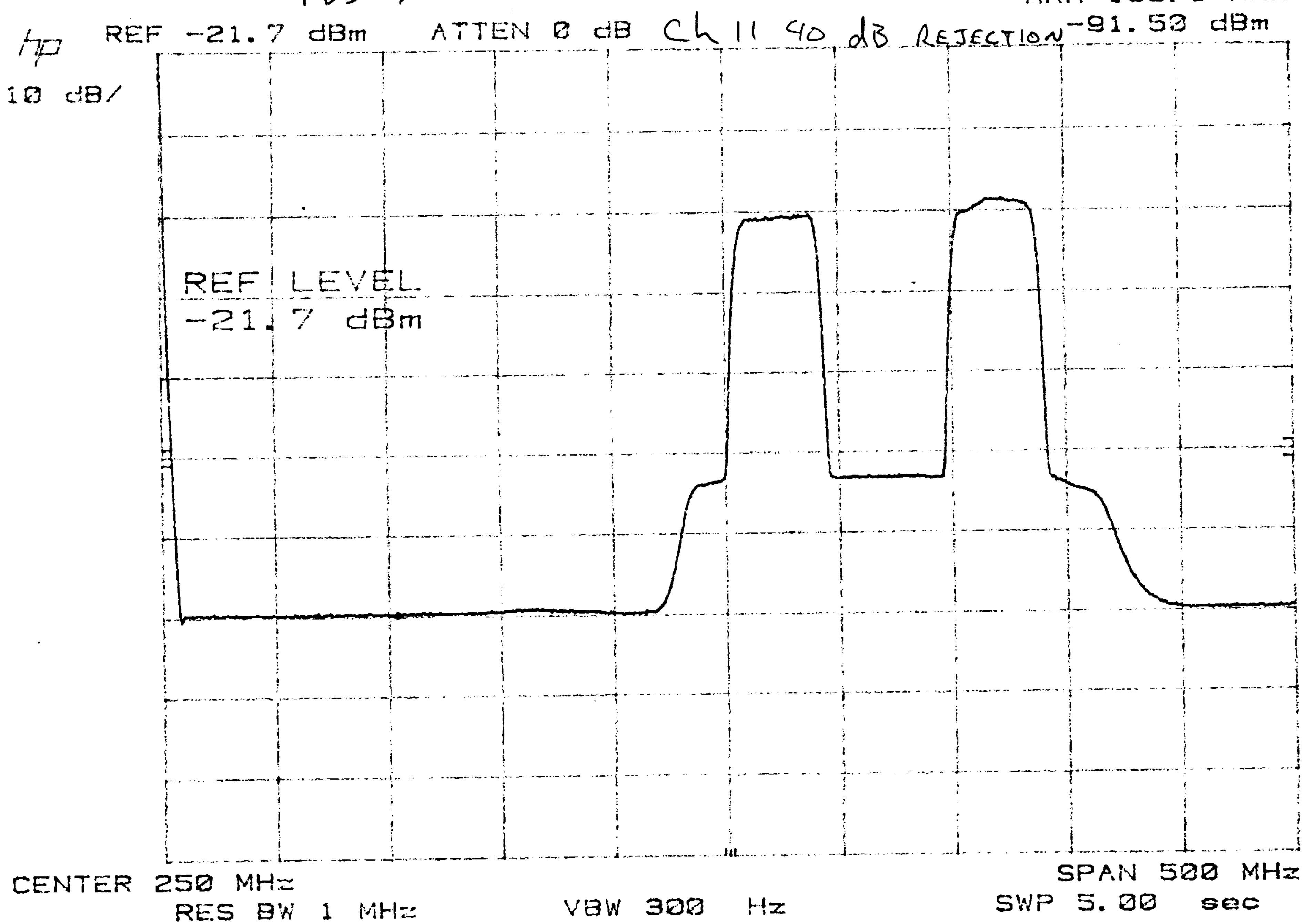


CENTER 322 MHz SPAN 150 MHz
RES BW 1 MHz VBW 30 Hz SWP 15.0 sec

S. 199 ATP
PLO #1 Ch. 11

P/N 1356429-2
S/N F06
TDS 7

FOR REFERENCE ONLY



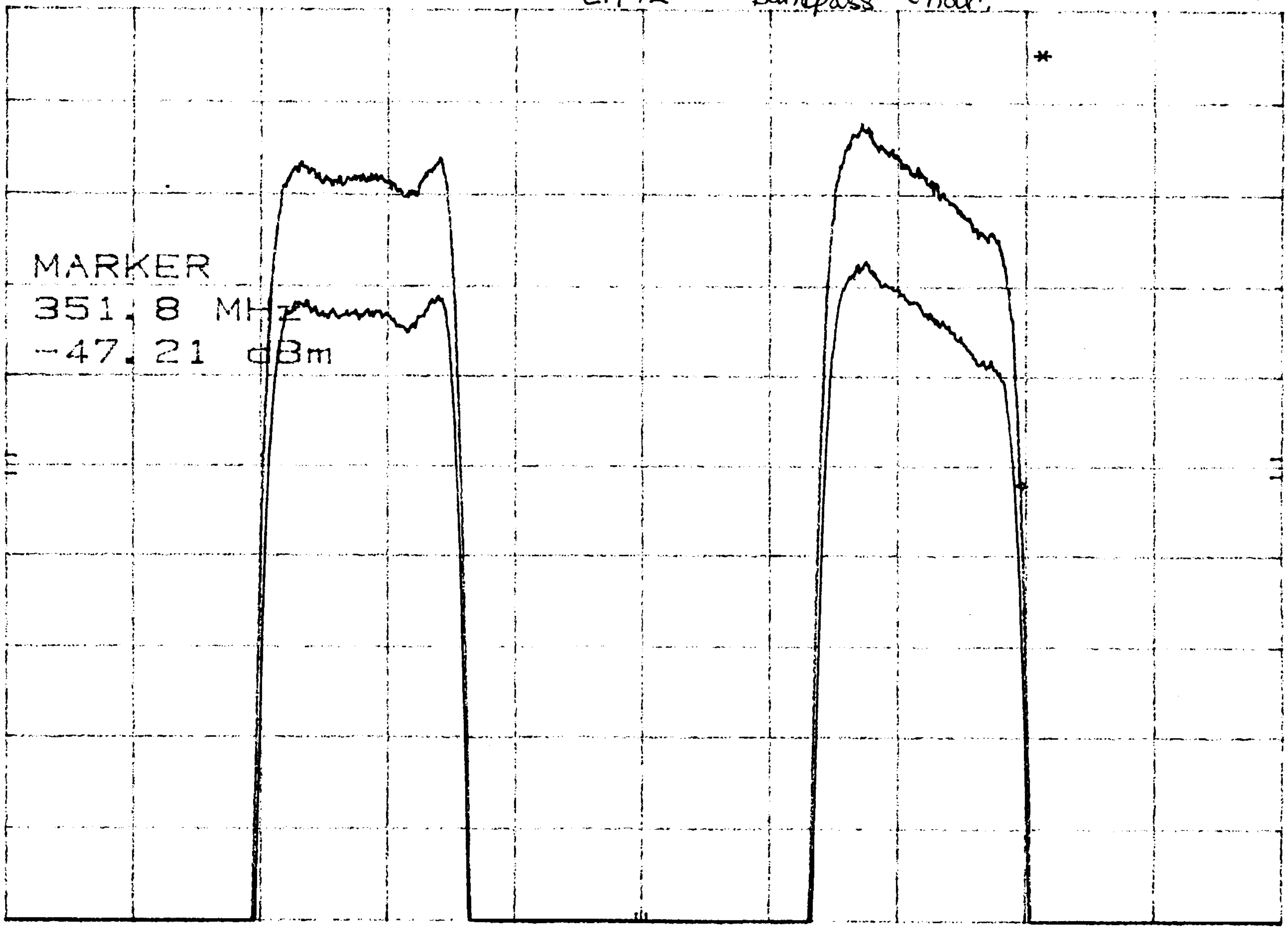
S/O # 622627
P/N # 1356429-2
TDS 7

FOR REFERENCE ONLY

hp REF -42.0 dBm ATTEN 10 dB Ch 12 3dB Bandpass Char. PLO #1 MKR 351.8 MHz -47.21 dBm

1 dB/

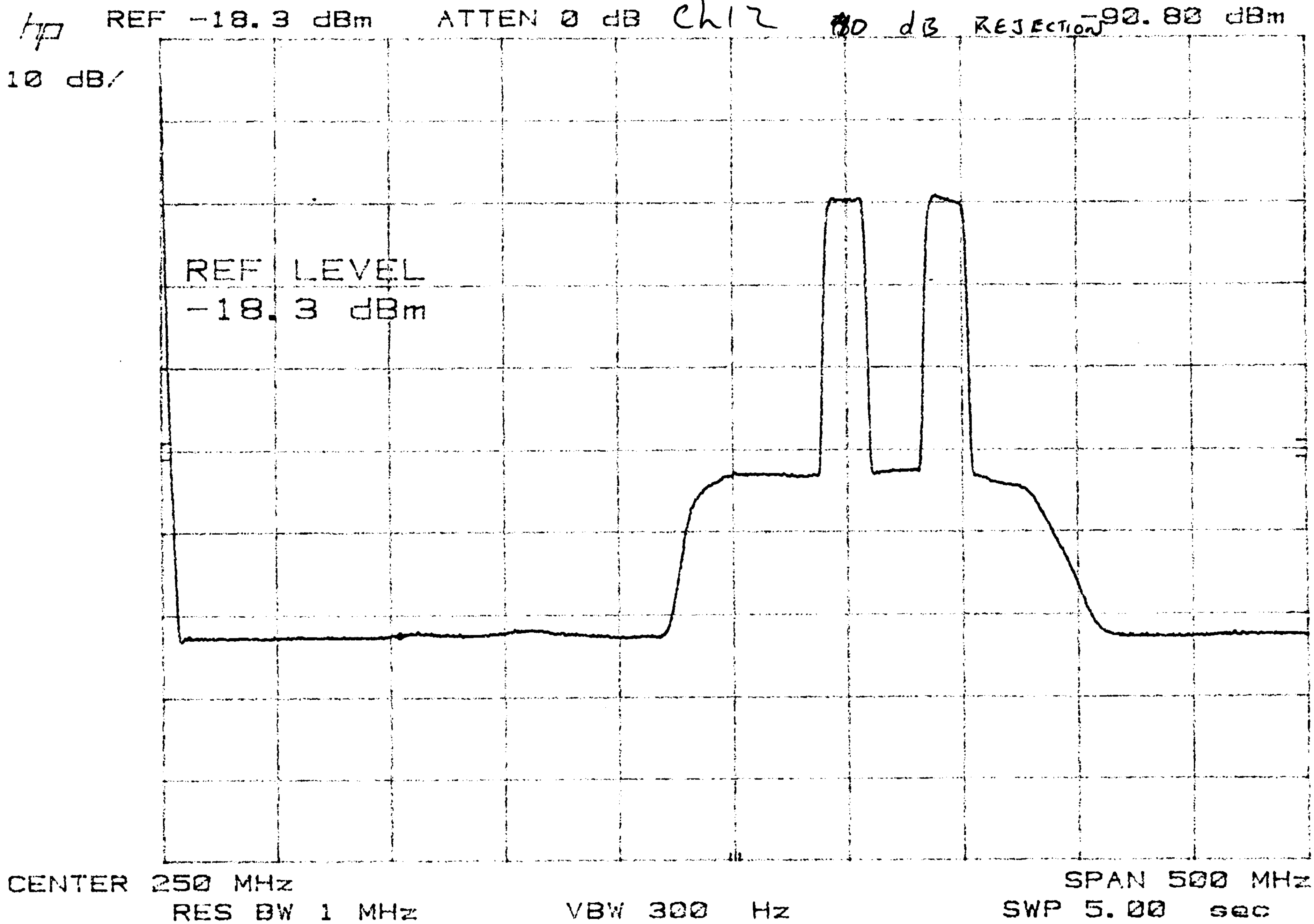
Nf: 4.42 dB



CENTER 322 MHz SPAN 100 MHz
RES BW 1 MHz VBW 30 Hz SWP 10.0 sec

PLO #1 Ch. 12 P/N 135424-2
S/N F06
TDS 7

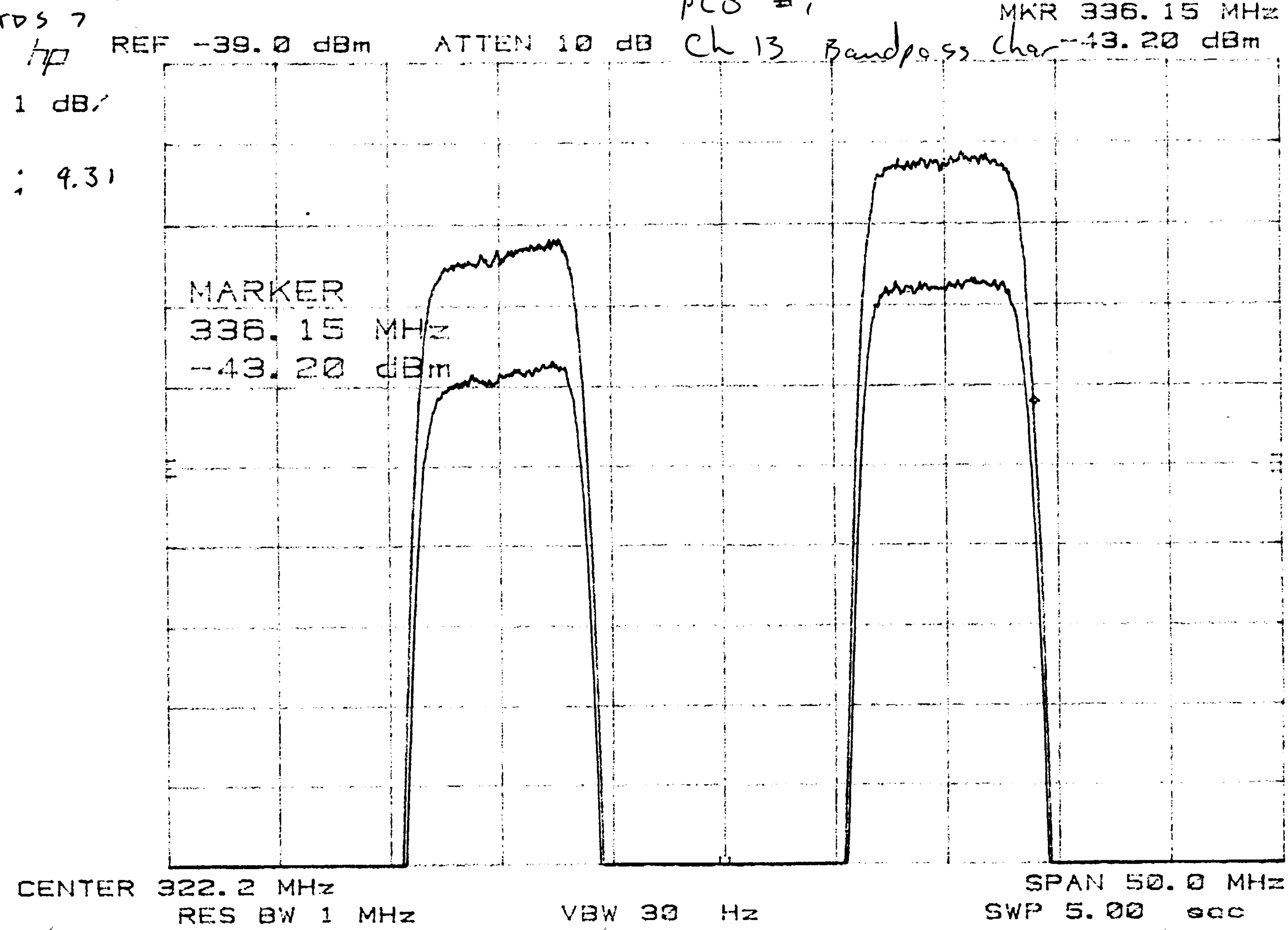
FOR REFERENCE ONLY



S/O 622 627
P/N 1356429-2
TDS 7

FOR REFERENCE ONLY

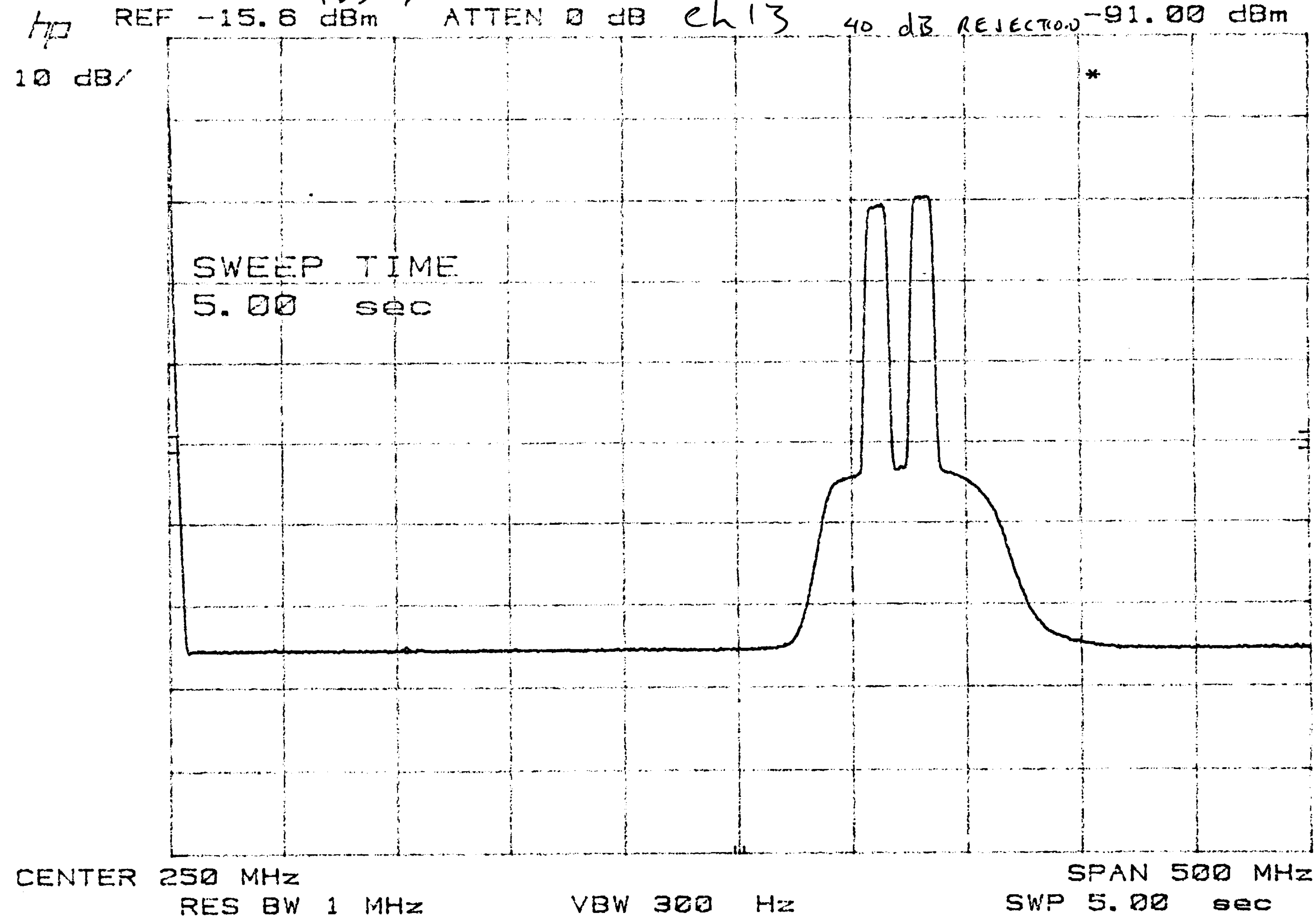
PLO #1
Ch 13 Bandpass Char



NF ; 4.31

PLO #1. ch.13 P/N 1356429-2
S/N F06
TDS 7

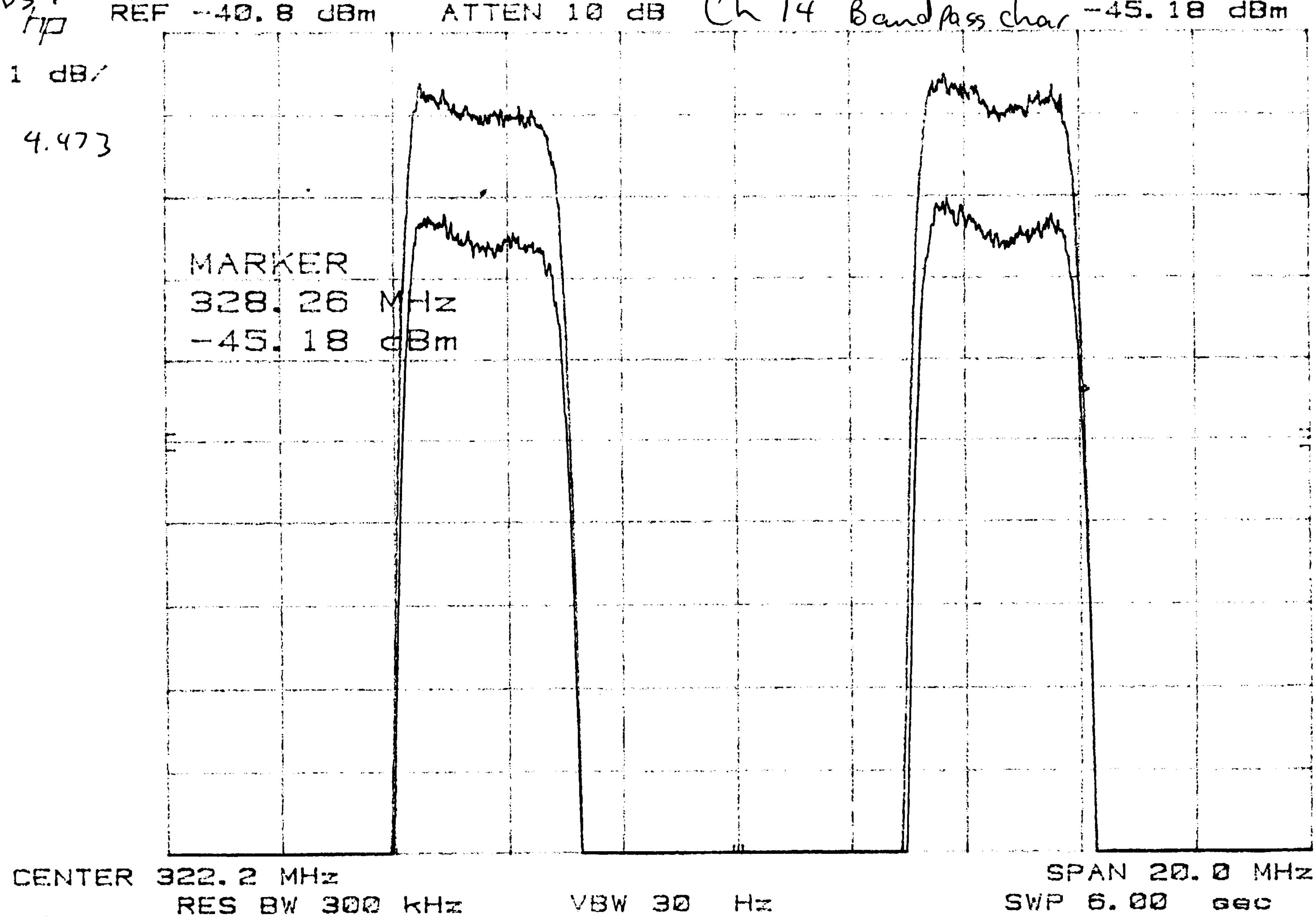
FOR REFERENCE ONLY



plo #2 ch 14
s/o 622627
p/n 1356429-2
TDS 7
hp

plot 1
Ch 14 Bandpass char

FOR REFERENCE ONLY

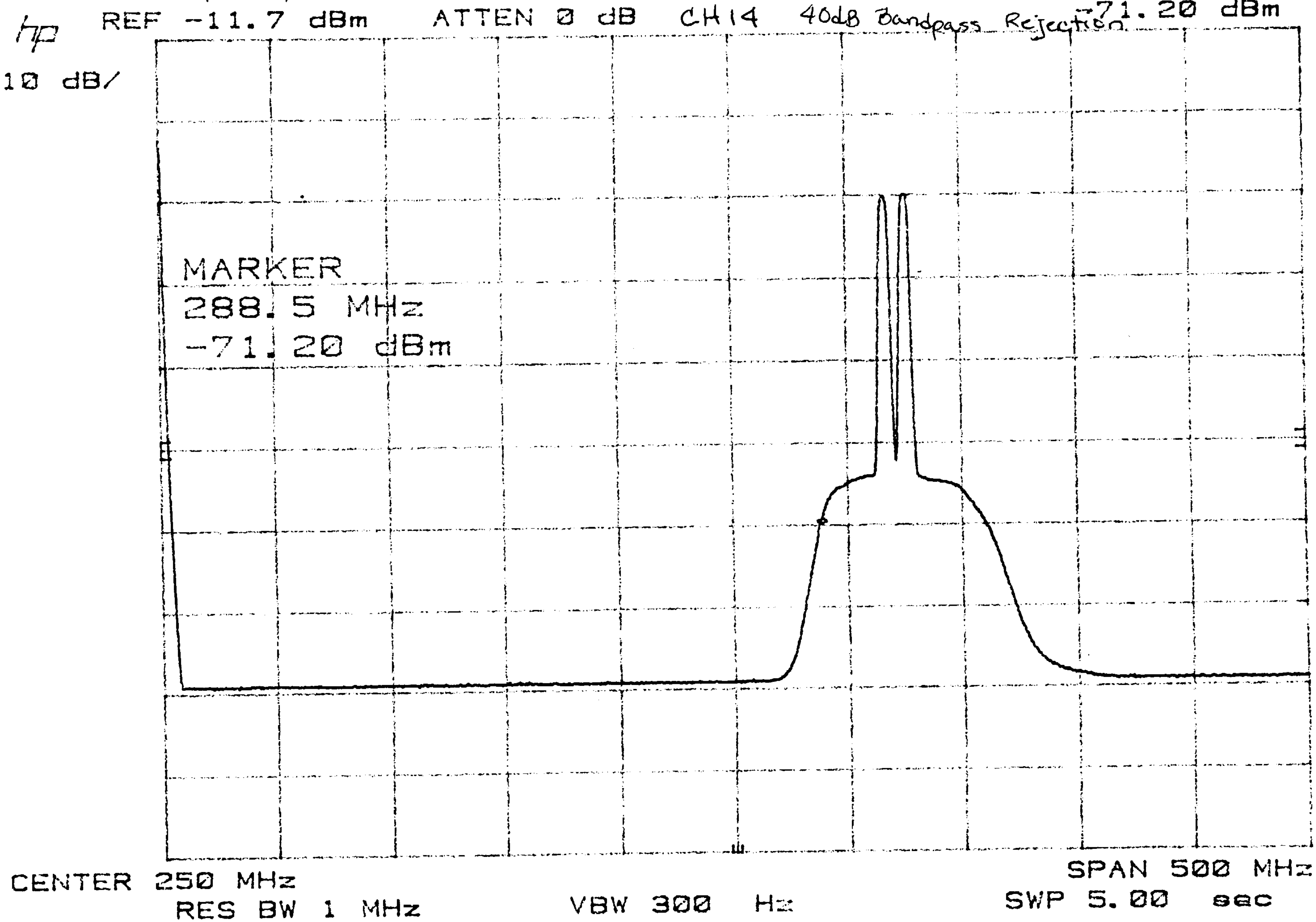


NF 4.473

P/N: 1356429-2
S/N: F06
TDS 7

PLO#1

FOR REFERENCE ONLY



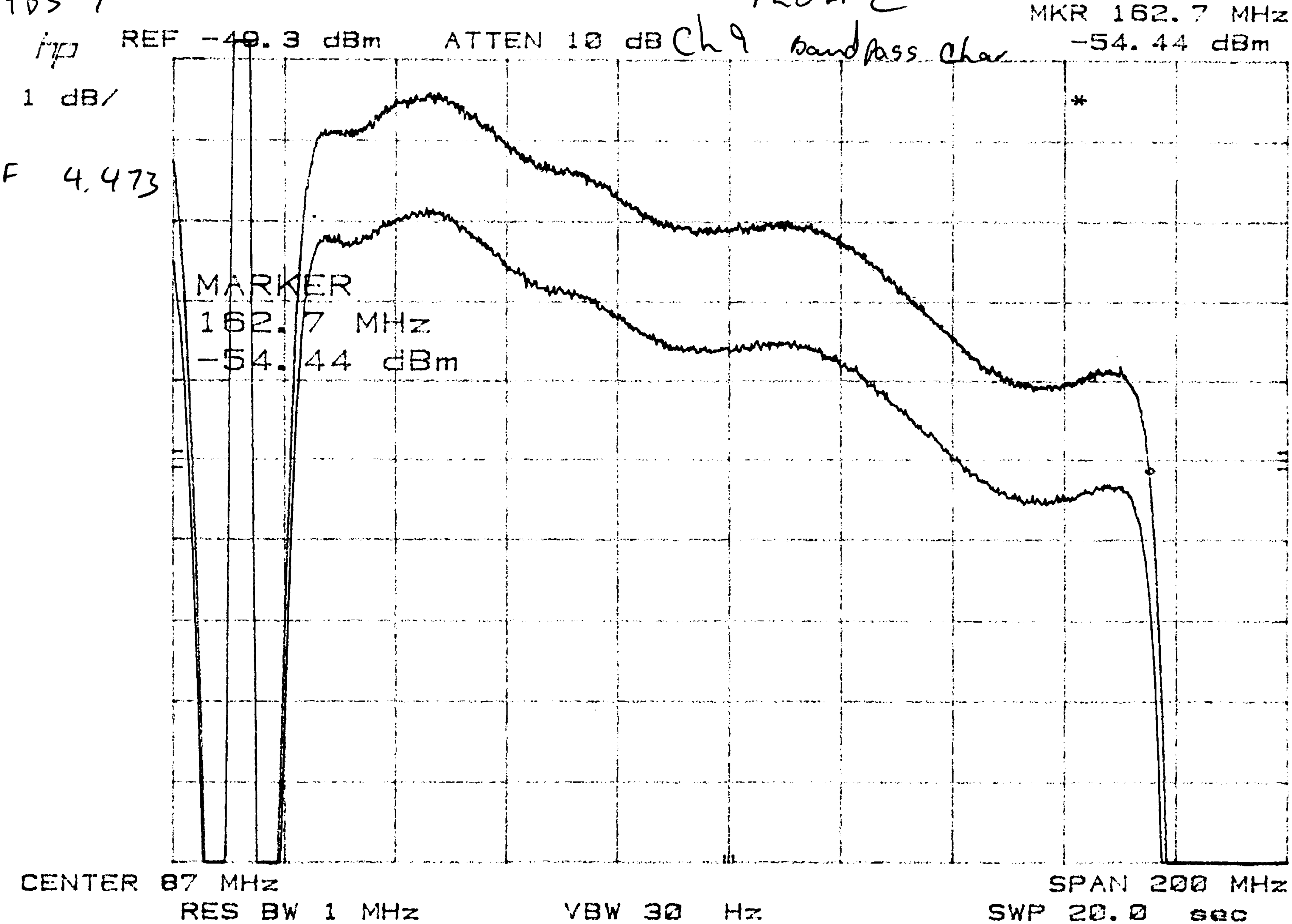
S/O 622627
P/N 1356429-2
TDS 7

FOR REFERENCE ONLY

PLOT #2

Ch 9 Bandpass Char

NF 4.473



PLO #2 ch 9

P/N 1356429-2

S/N F06

TDS 7

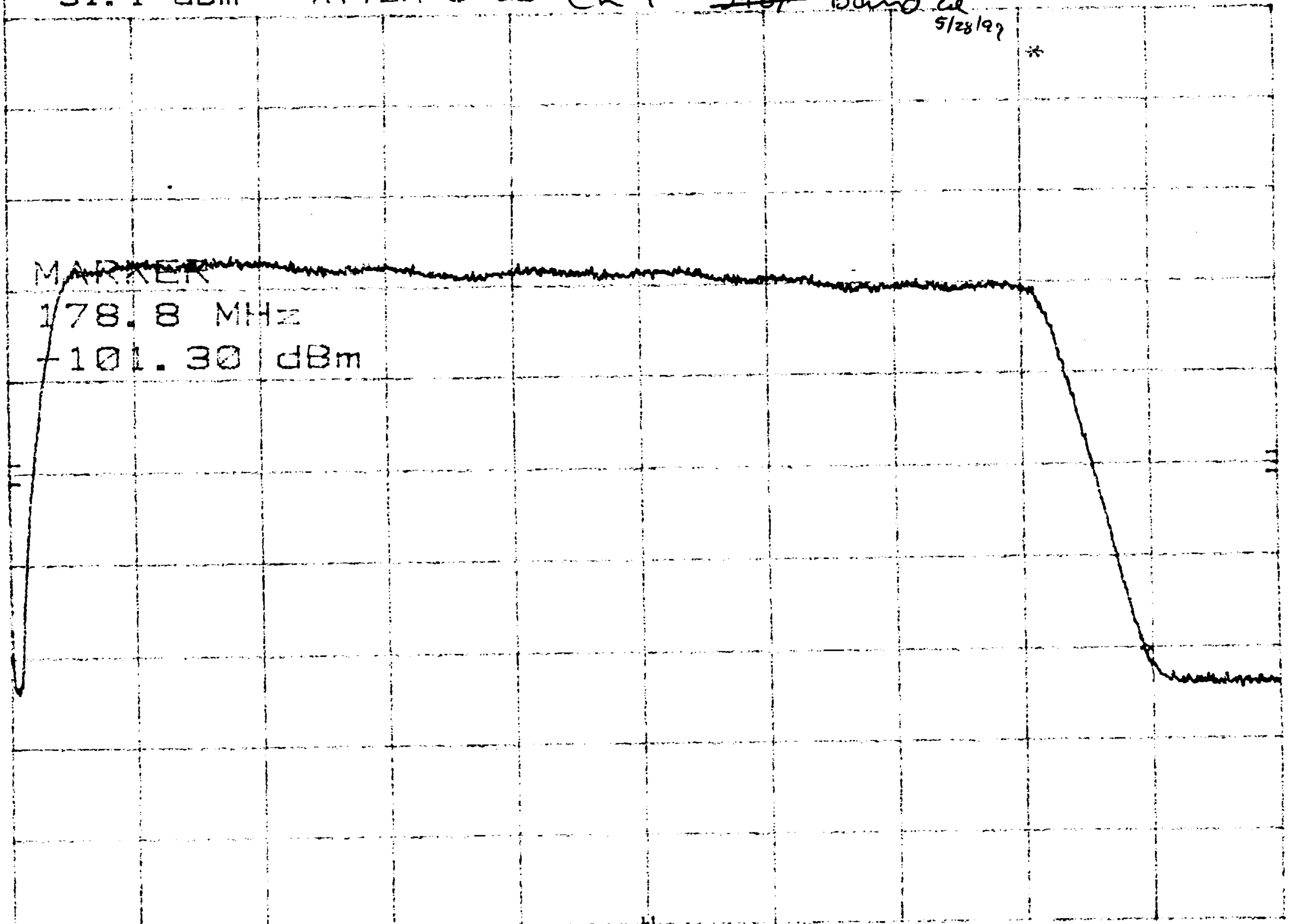
FOR REFERENCE ONLY

40 dB Bandpass Reject

~~Stop Band~~ ue 5/28/97

hp REF -31.1 dBm ATTEN 0 dB Ch 9 MKR 178.8 MHz -101.30 dBm

10 dB/



CENTER 100 MHz SPAN 200 MHz

RES BW 30 kHz VBW 300 Hz SWP 60.0 sec

PLO#2 ch 9

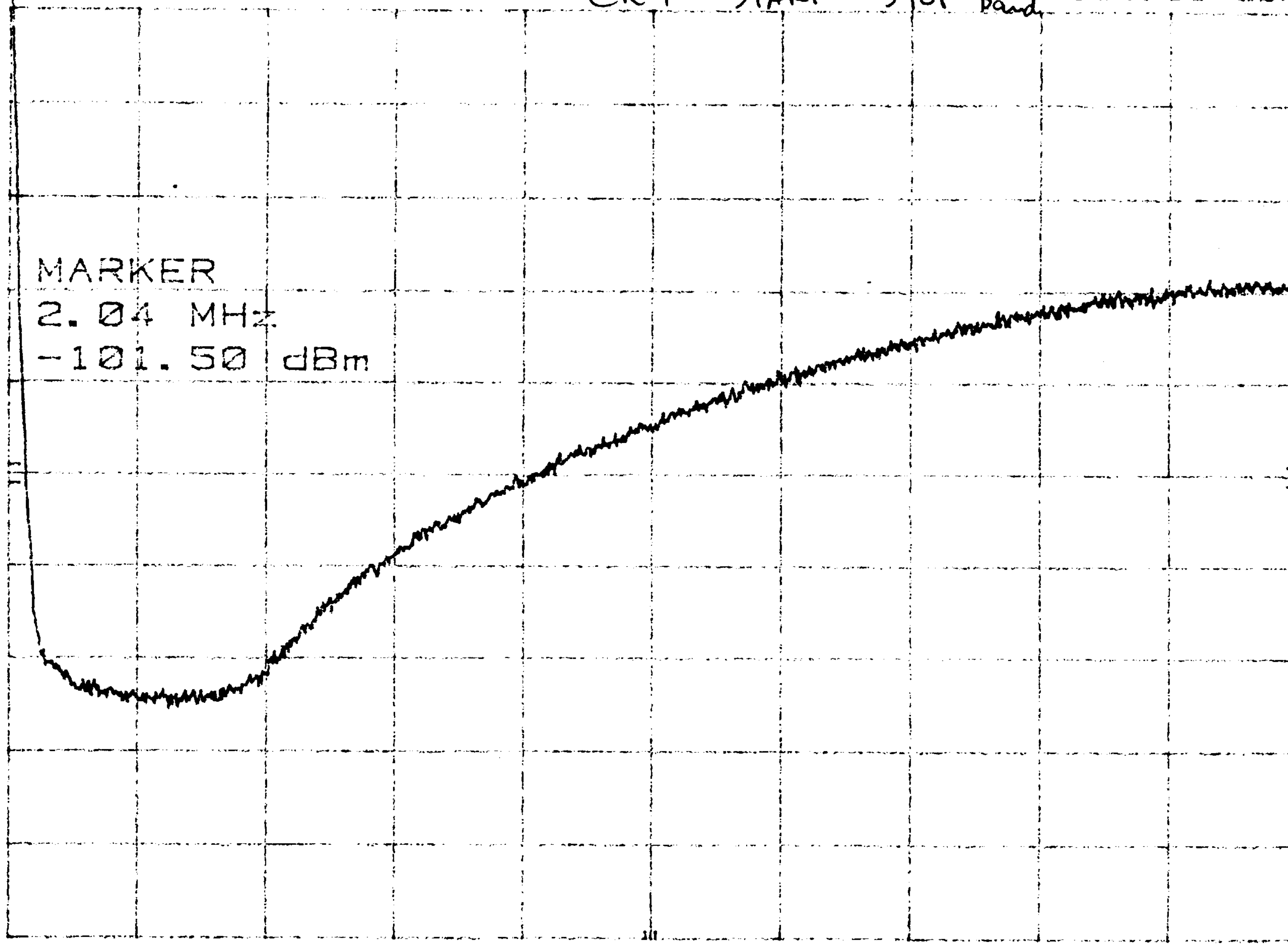
P/N 1356424-2
S/N F06
TDS 7

FOR REFERENCE ONLY

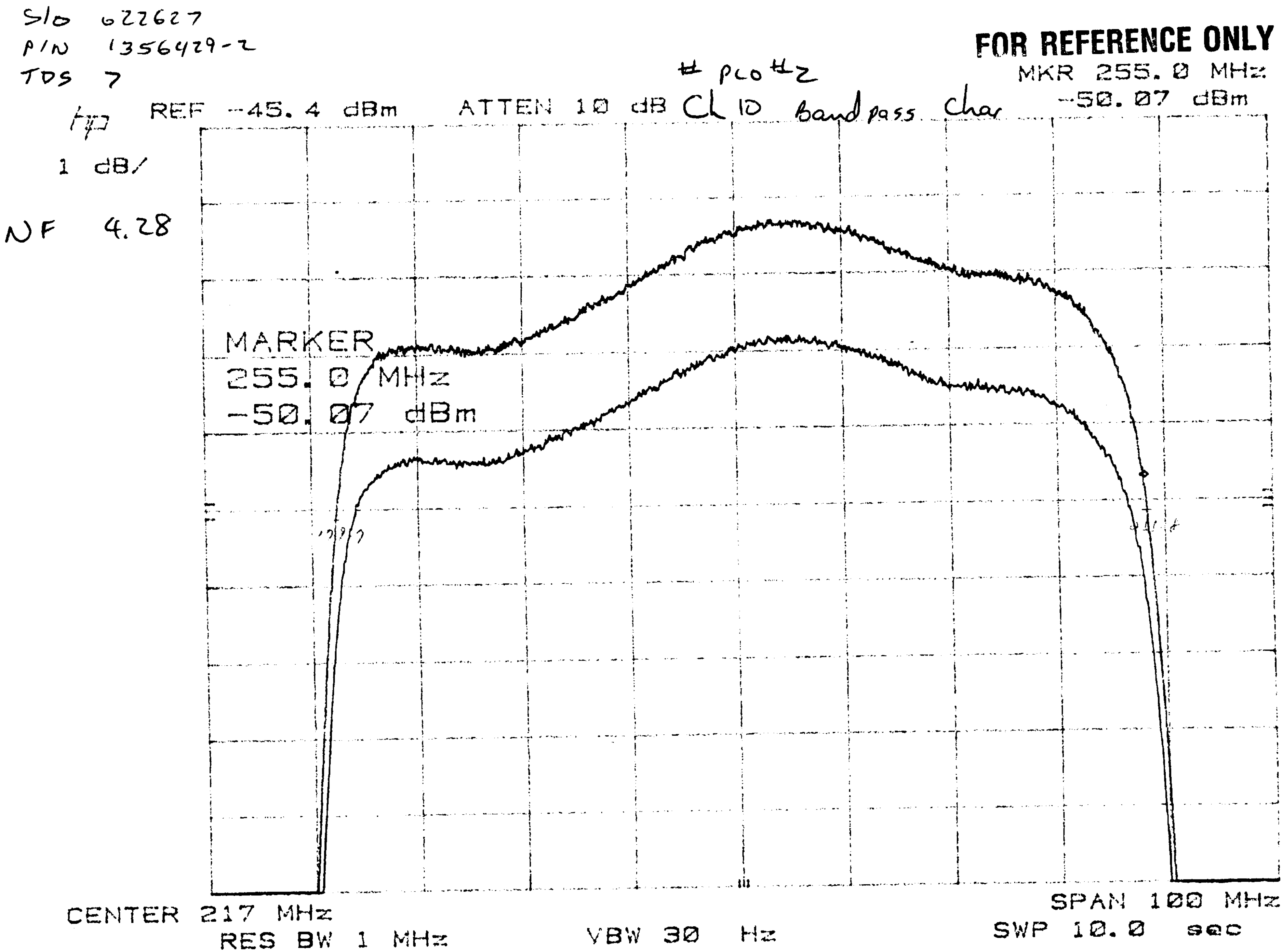
MKR 2.04 MHz

hp REF -31.1 dBm ATTEN 0 dB Ch9 START - STOP Band -101.50 dBm

10 dB/



START 0 Hz
RES BW 30 kHz VBW 300 Hz
STOP 10.0 MHz
SWP 3.00 sec


S/O 622627
P/N 1356429-2
TDS 7
hp
FOR REFERENCE ONLY
MKR 255.0 MHz
-50.07 dBm
PLO #2
REF -45.4 dBm
ATTEN 10 dB
CL 10 Bandpass Char
1 dB/
NF 4.28
MARKER
255.0 MHz
-50.07 dBm
CENTER 217 MHz
RES BW 1 MHz
VBW 30 Hz
SPAN 100 MHz
SWP 10.0 sec

PLO # 2 ch 10

P/N 1356429-2

S/N F06

TDS 7

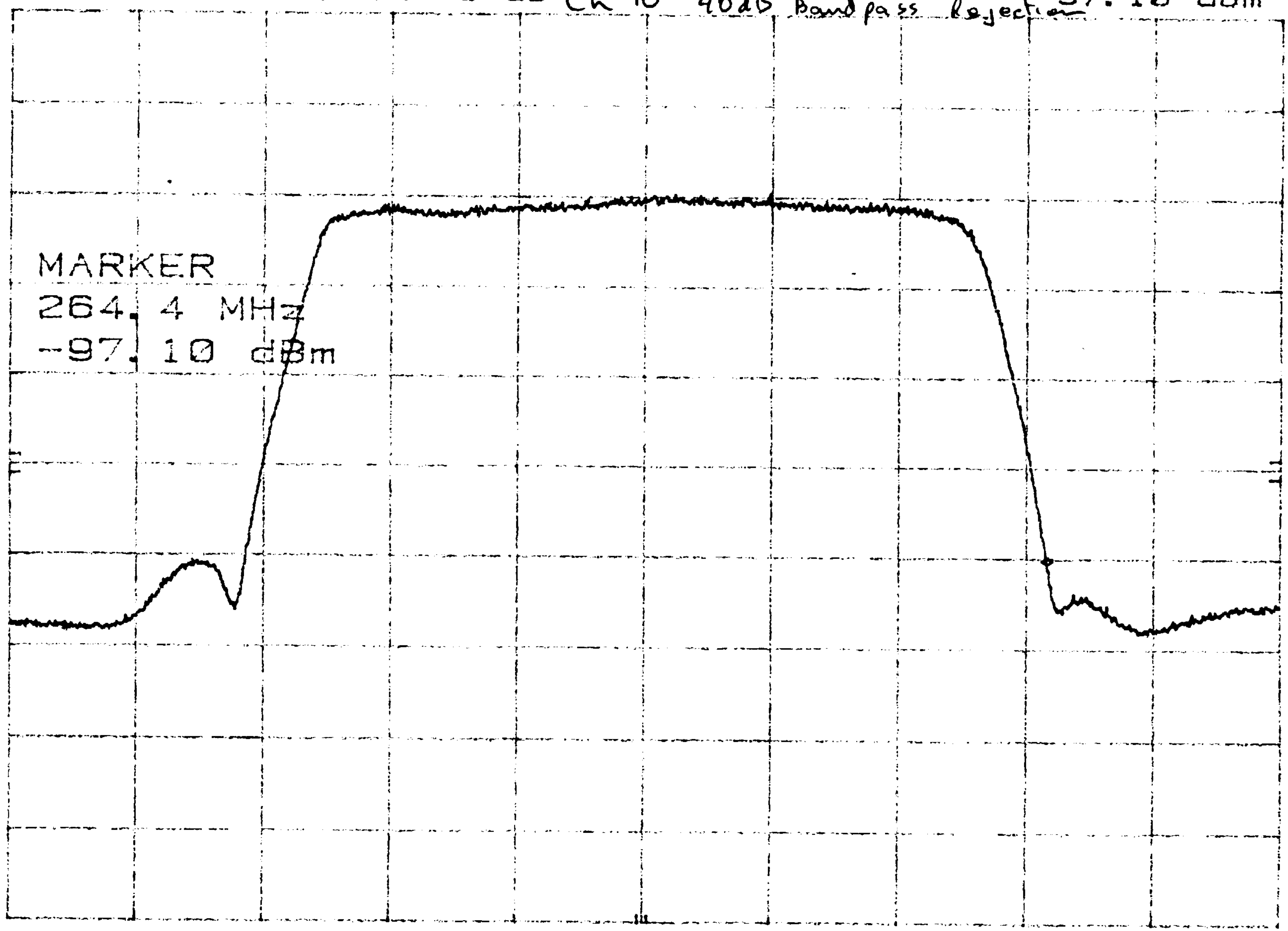
FOR REFERENCE ONLY

hp REF -36.9 dBm ATTEN 0 dB Ch 10 40dB Bandpass Rejection

MKR 264.4 MHz

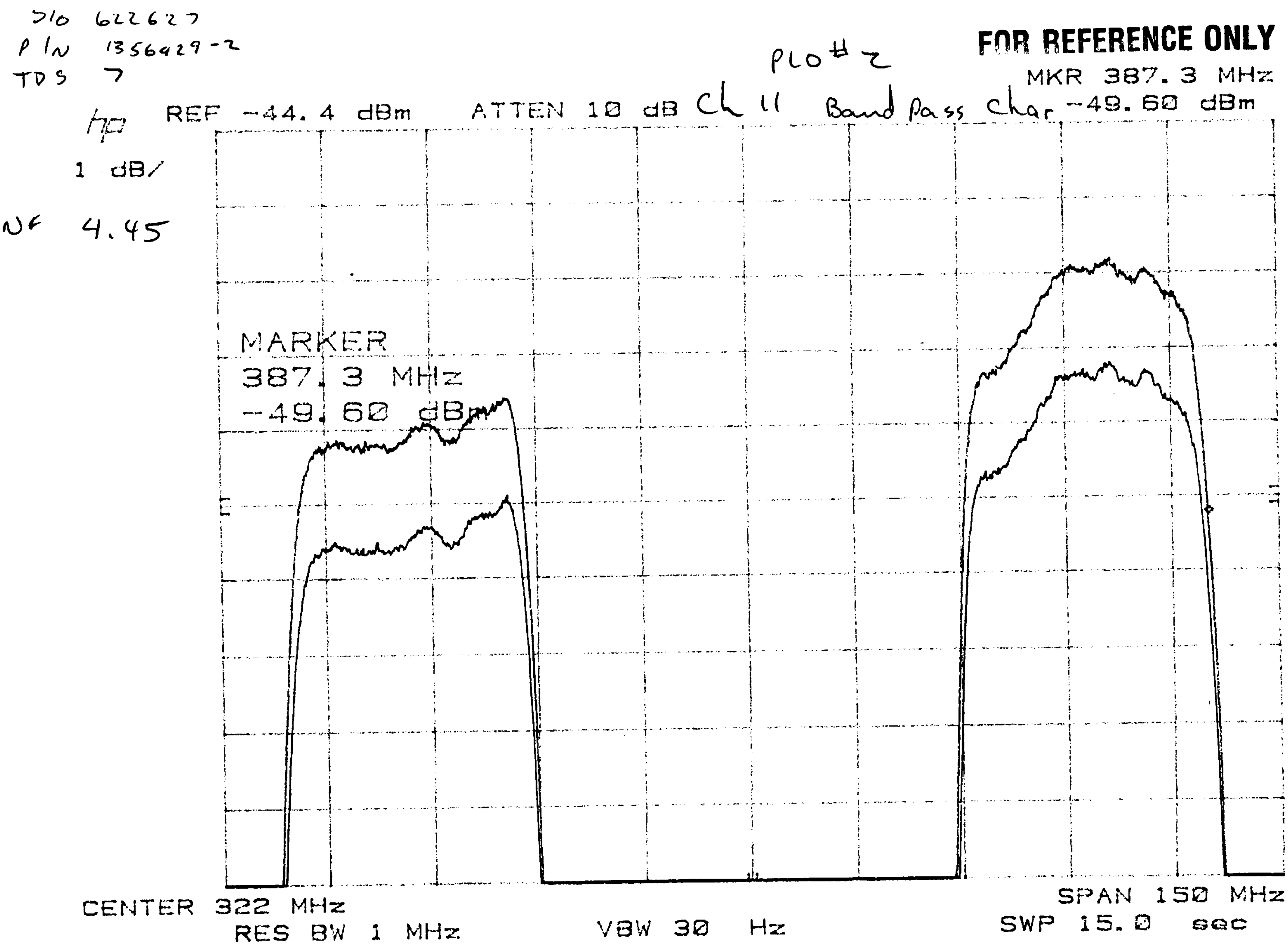
-97.10 dBm

10 dB/



CENTER 217 MHz SPAN 150 MHz

RES BW 30 kHz VBW 300 Hz SWP 75.0 sec


S/O 622627
P/N 1356429-2
TDS 7
PLO #2
FOR REFERENCE ONLY
MKR 387.3 MHz
hp
REF -44.4 dBm
ATTEN 10 dB
Ch 11 Band Pass Char
-49.60 dBm
1 dB/
NF 4.45
MARKER
387.3 MHz
-49.60 dBm
CENTER 322 MHz
RES BW 1 MHz
VBW 30 Hz
SPAN 150 MHz
SWP 15.0 sec

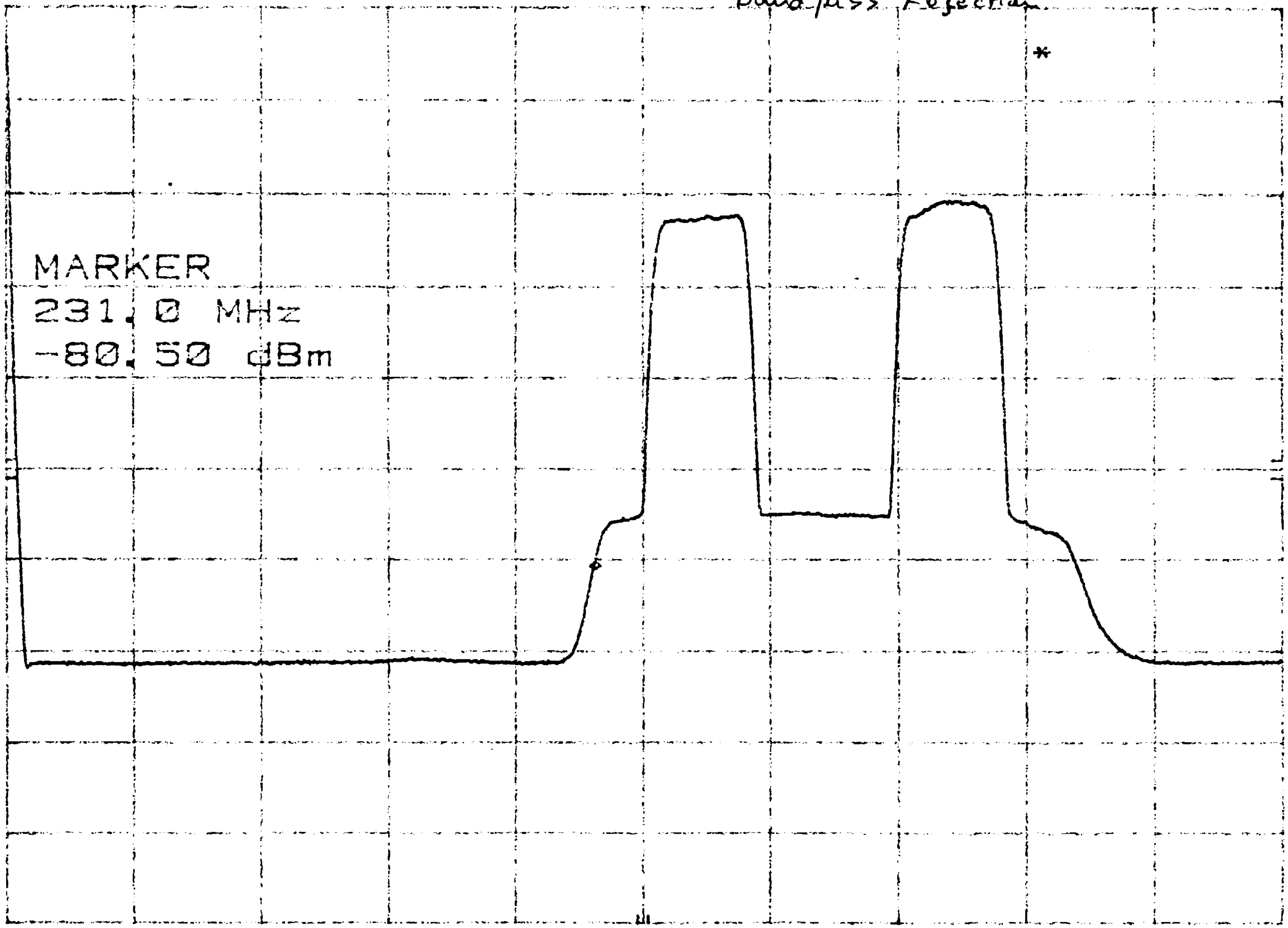
PLO #2 ch11 P/N 1356429-2
S/N F06
TDS 7

FOR REFERENCE ONLY

MKR 231.0 MHz

REF -19.8 dBm ATTEN 0 dB Ch 11 bandpass Rejection -80.50 dBm

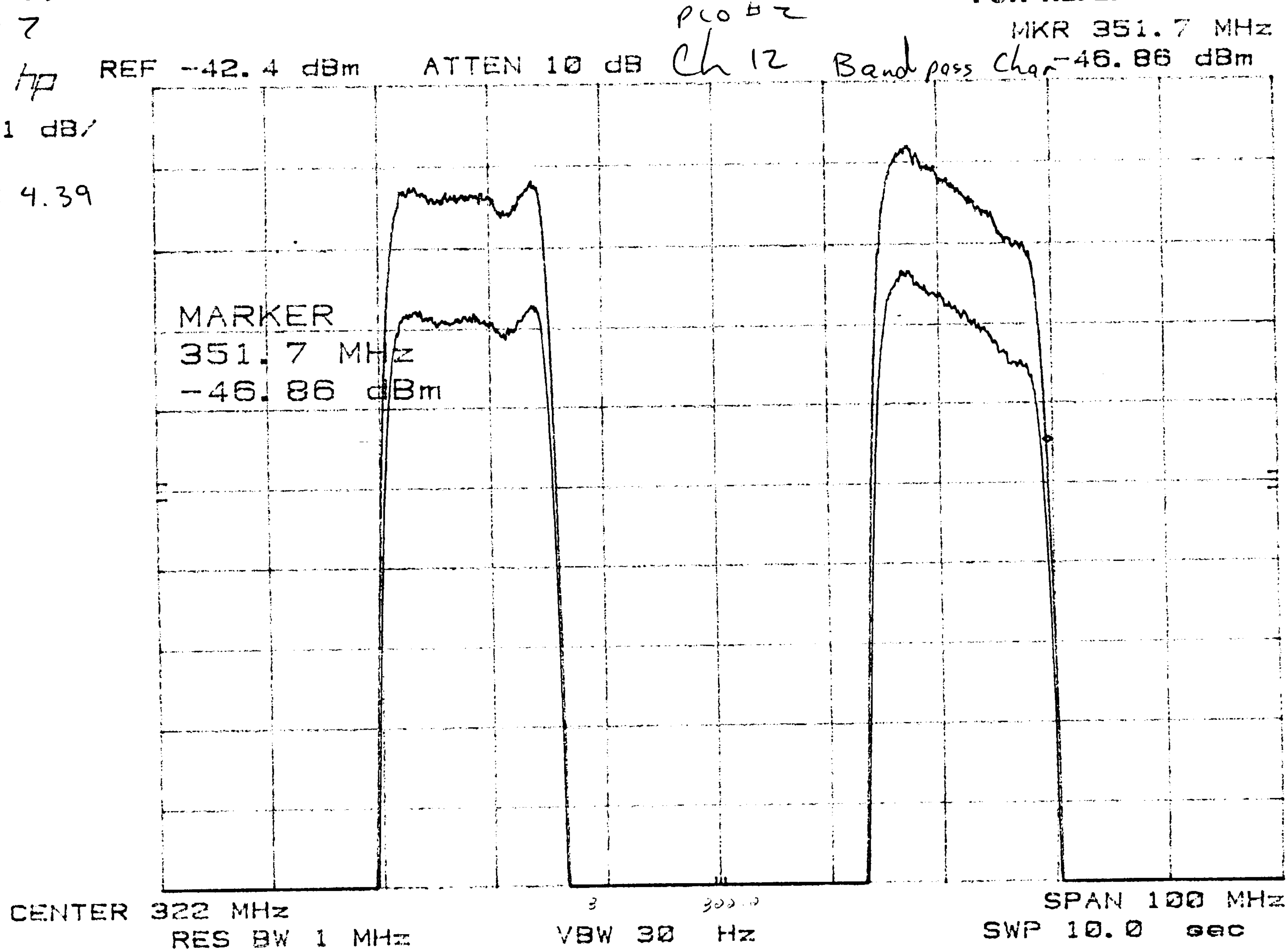
10 dB/



CENTER 250 MHz SPAN 500 MHz
RES BW 1 MHz VBW 300 Hz SWP 5.00 sec

S/S 6c-621
P/N 1356429-2
TDS 7

FOR REFERENCE ONLY



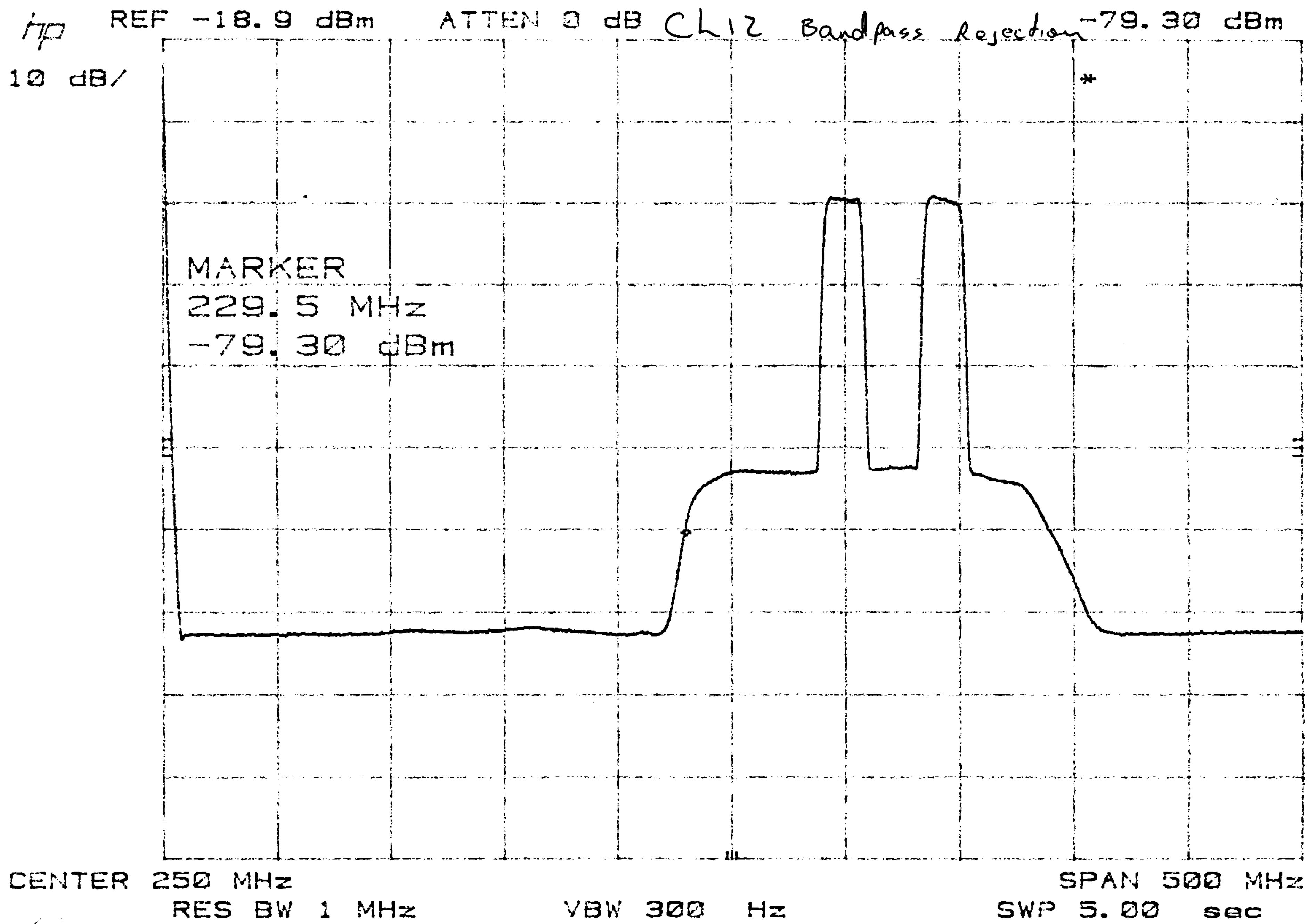
NF: 4.39

PLO # 2 ch12

s/N F06

TD S 7

FOR REFERENCE ONLY



S/O 602627
P/N 1356929-2
TPS 7

FOR REFERENCE ONLY

PLO #2

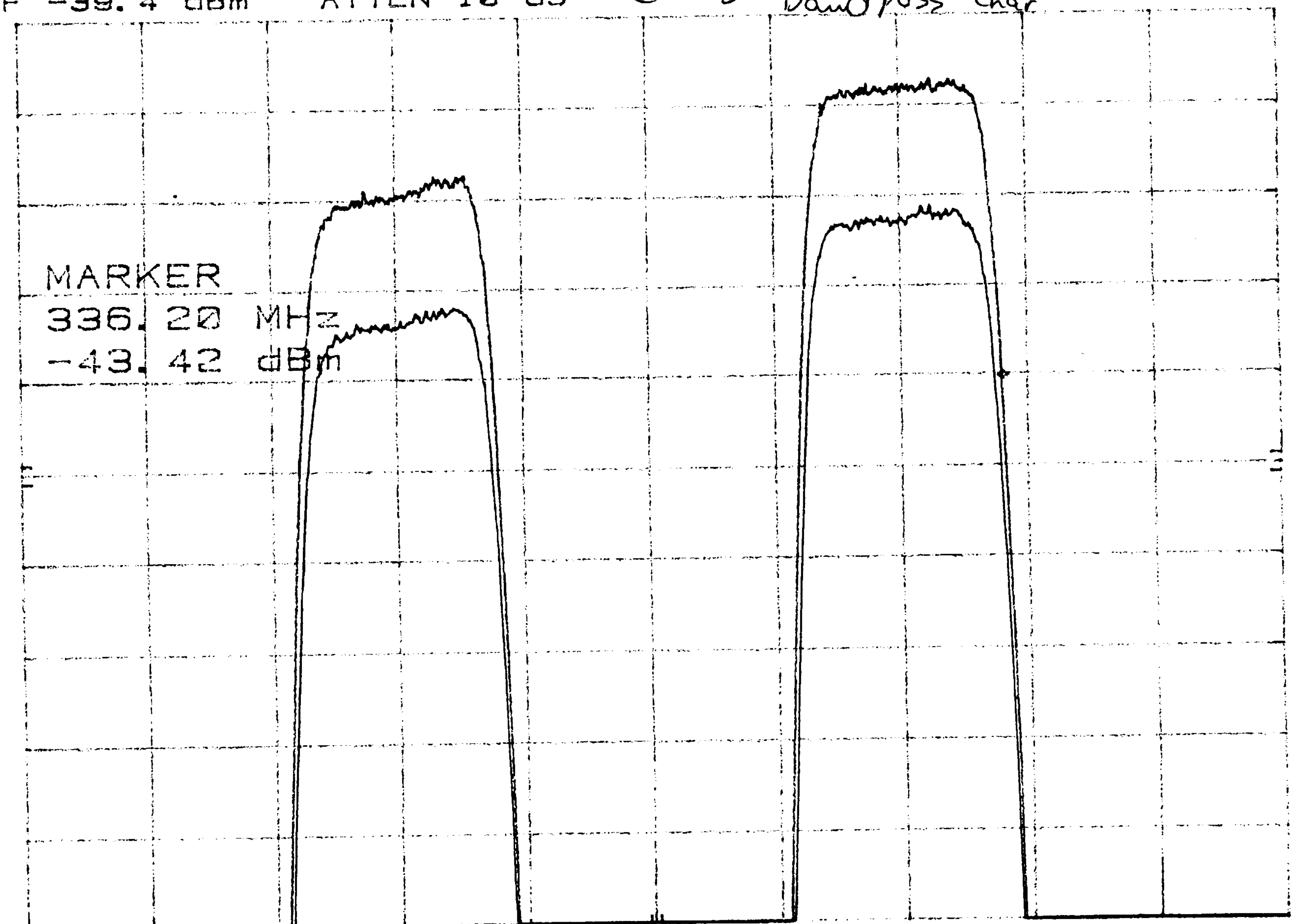
Ch 13 Band Pass Char

MKR 336.20 MHz
-43.42 dBm

hp REF -39.4 dBm ATTEN 10 dB

1 dB/

NF: 4,47



CENTER 322.2 MHz
RES BW 1 MHz
VBW 30 Hz
SPAN 50.0 MHz
SWP 5.00 sec

PLO #2 Ch13

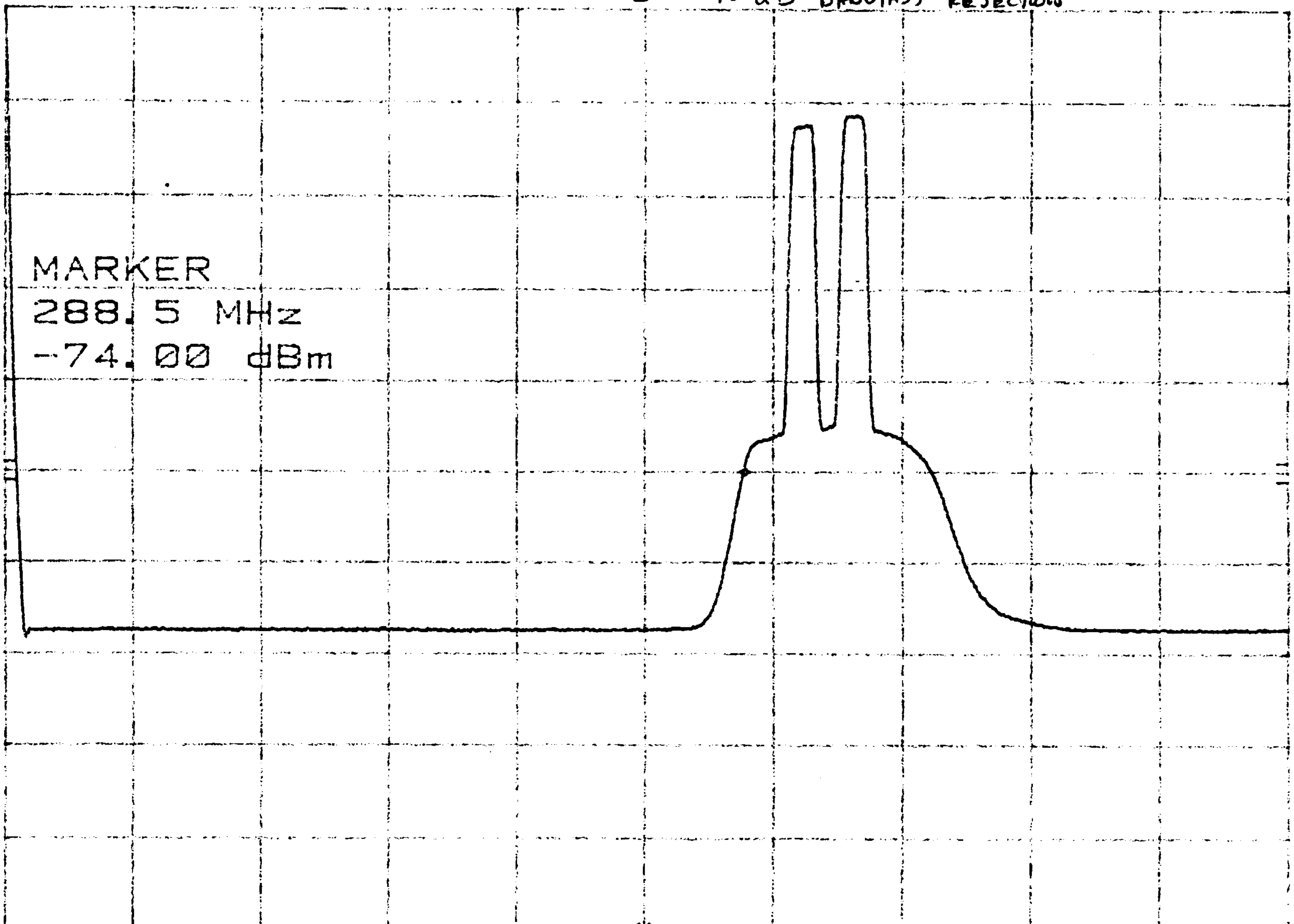
P/N 1556404-C
S/N F06
TDS 7

FOR REFERENCE ONLY

MKR 288.5 MHz
-74.00 dBm

REF -24.0 dBm ATTEN 0 dB Ch13 40 dB BANDPASS REJECTION

10 dB/



CENTER 250 MHz
RES BW 1 MHz VBW 300 Hz SWP 5.00 sec
SPAN 500 MHz

S/O 622627
P/N 1356429-2
TDS 7
hp

NF: 4.92

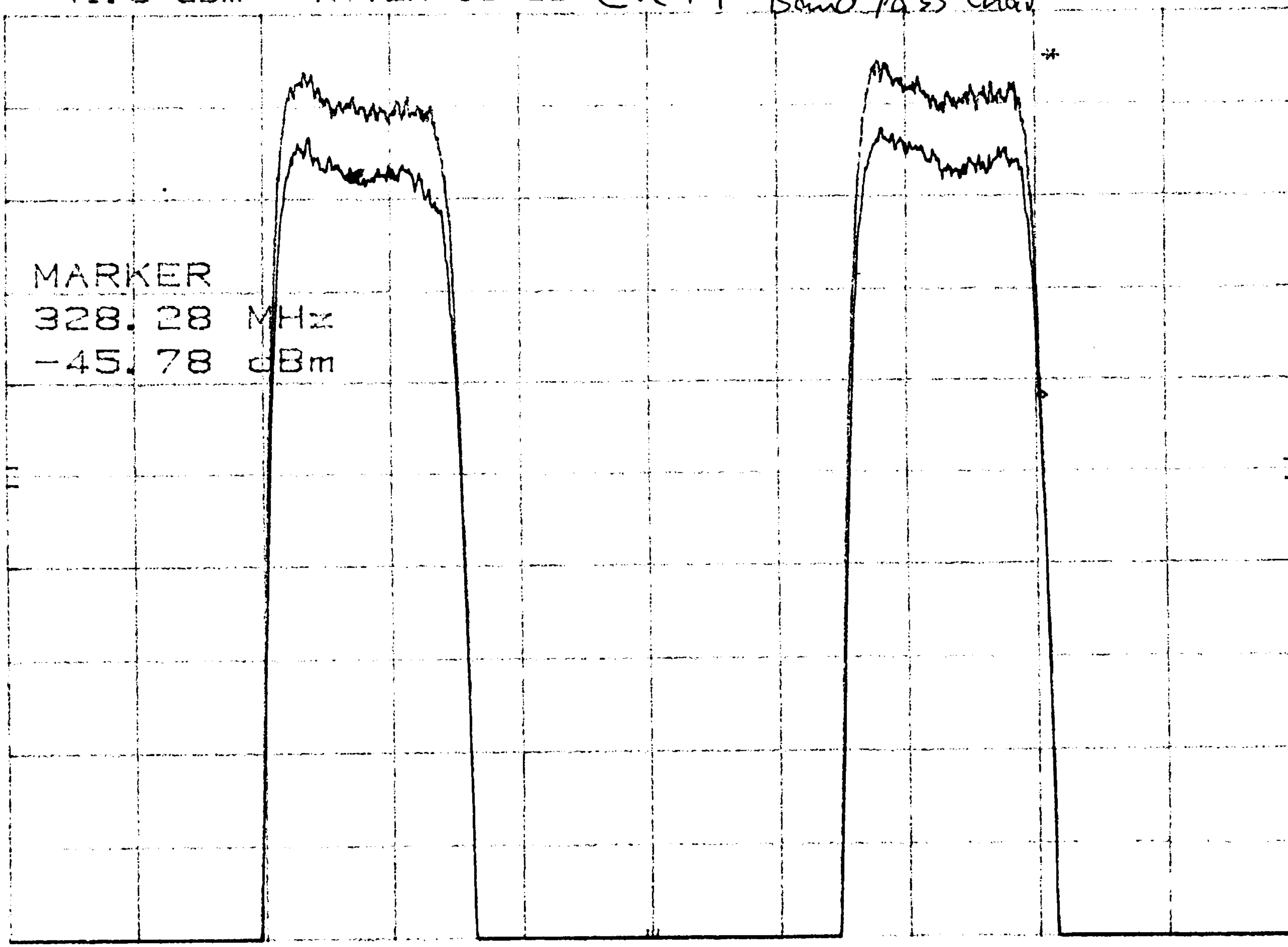
FOR REFERENCE ONLY

PLO #2 Ch 14 Band Pass Char

MKR 328.28 MHz
-45.78 dBm

REF -41.6 dBm ATTEN 10 dB

1 dB/



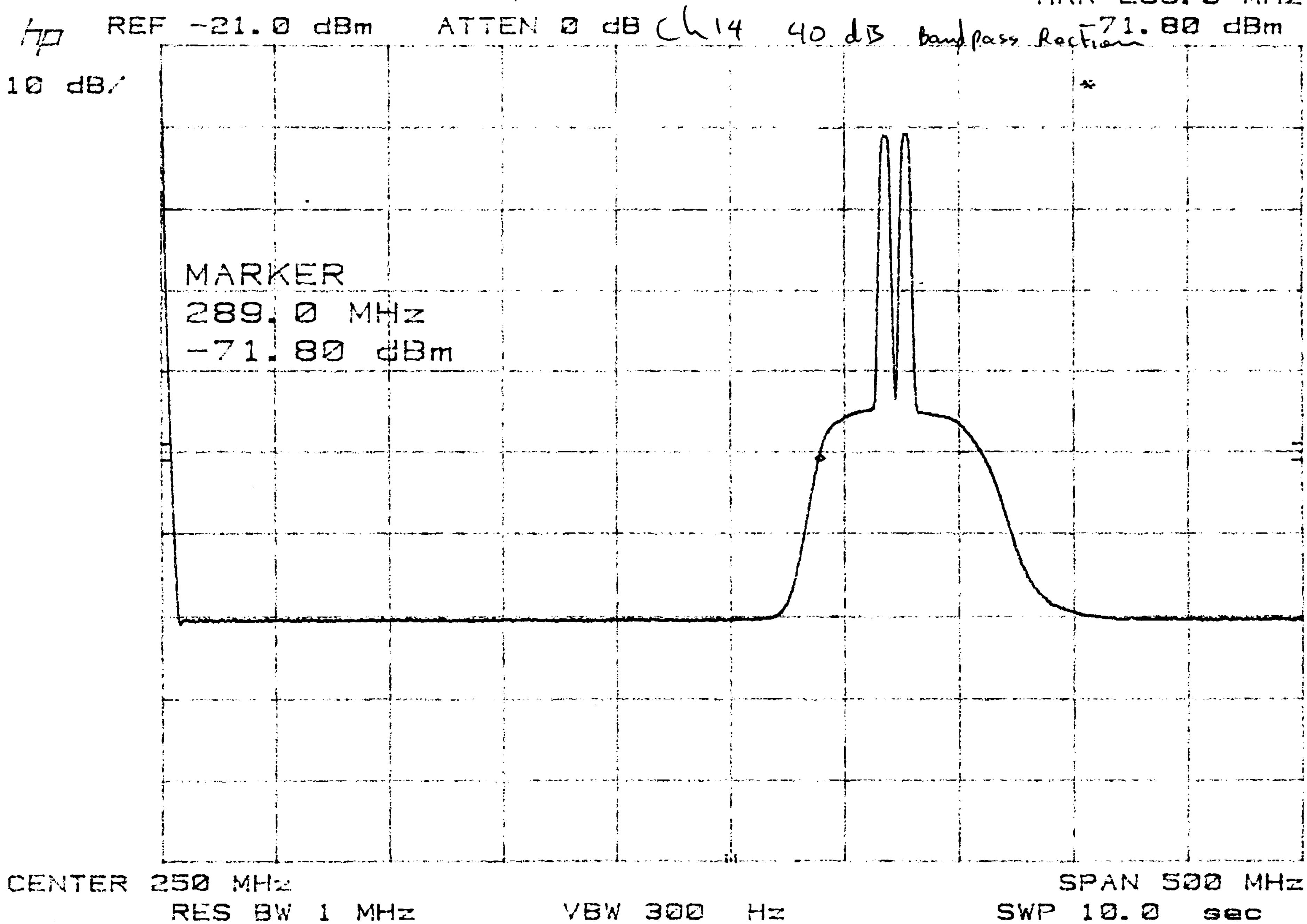
CENTER 322.2 MHz
RES BW 300 kHz VBW 30 Hz
SPAN 20.0 MHz
SWP 6.00 sec

FCO # 2 ch 14

S/N F06

TDS 7

FOR REFERENCE ONLY



S/O 6c2627
P/N 1386929
S/N F06
TDS 7
hp

FOR REFERENCE ONLY

PLO #1

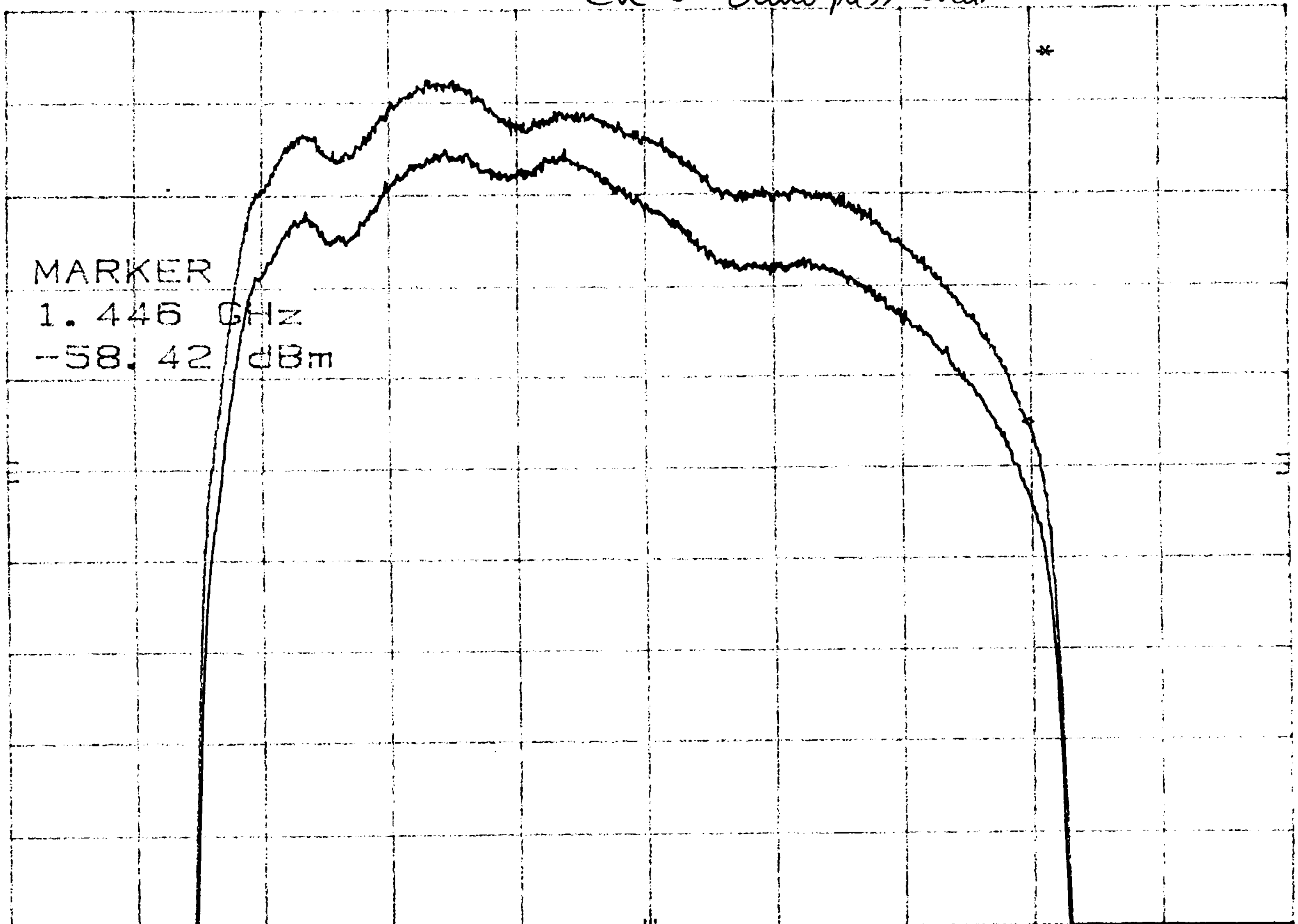
3dB Ch 15 Bandpass Char

MKR 1.446 GHz
-58.42 dBm

REF -53.9 dBm ATTEN 10 dB

1 dB/

NF = 6.94



CENTER 1.00 GHz
RES BW 3 MHz
VBW 100 Hz
SPAN 1.50 GHz
SWP 15.0 sec

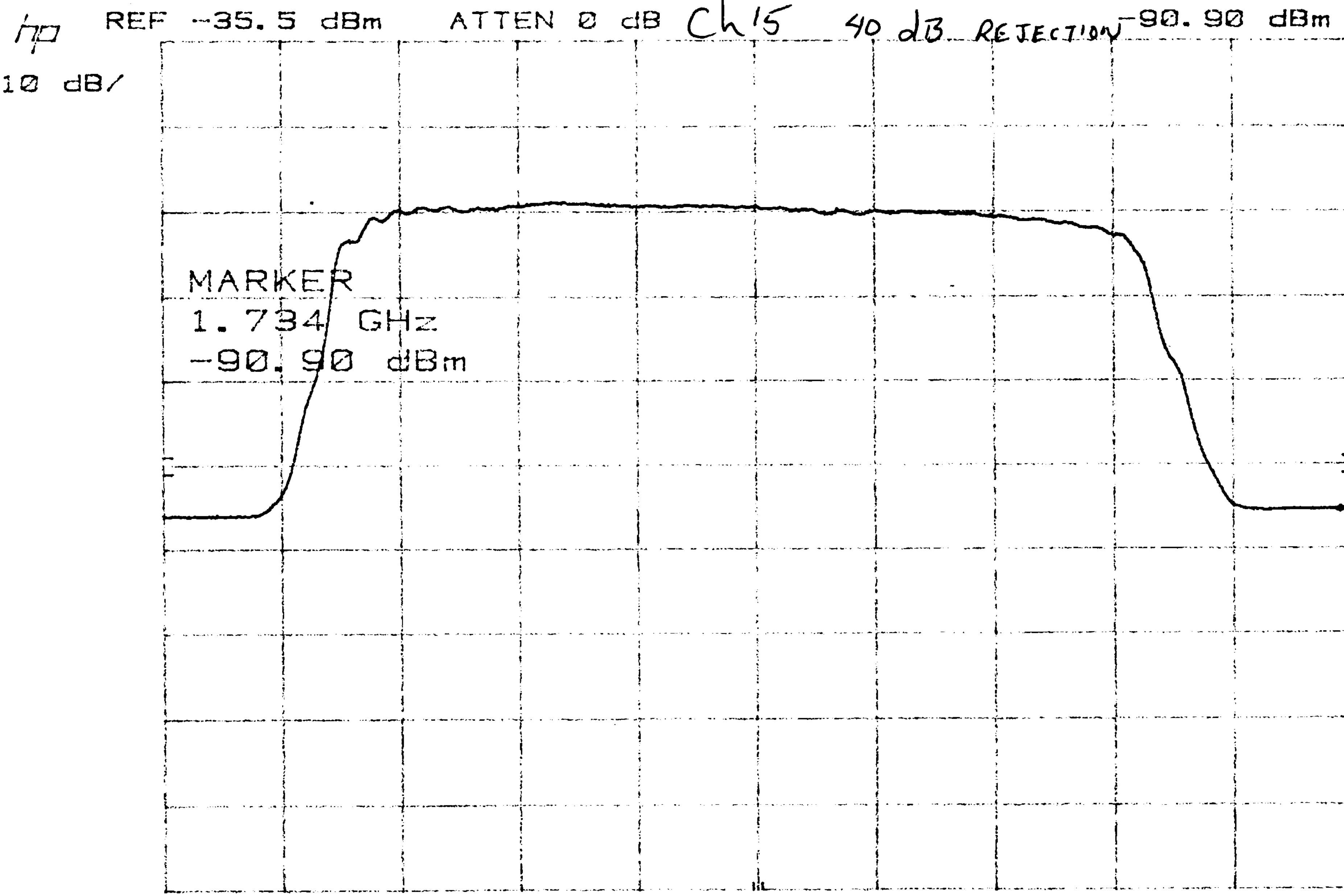
Ch.15 ATP

P/N 1356429-2

S/N F06 TD5 7

FOR REFERENCE ONLY

MKR 1.734 GHz -90.90 dBm

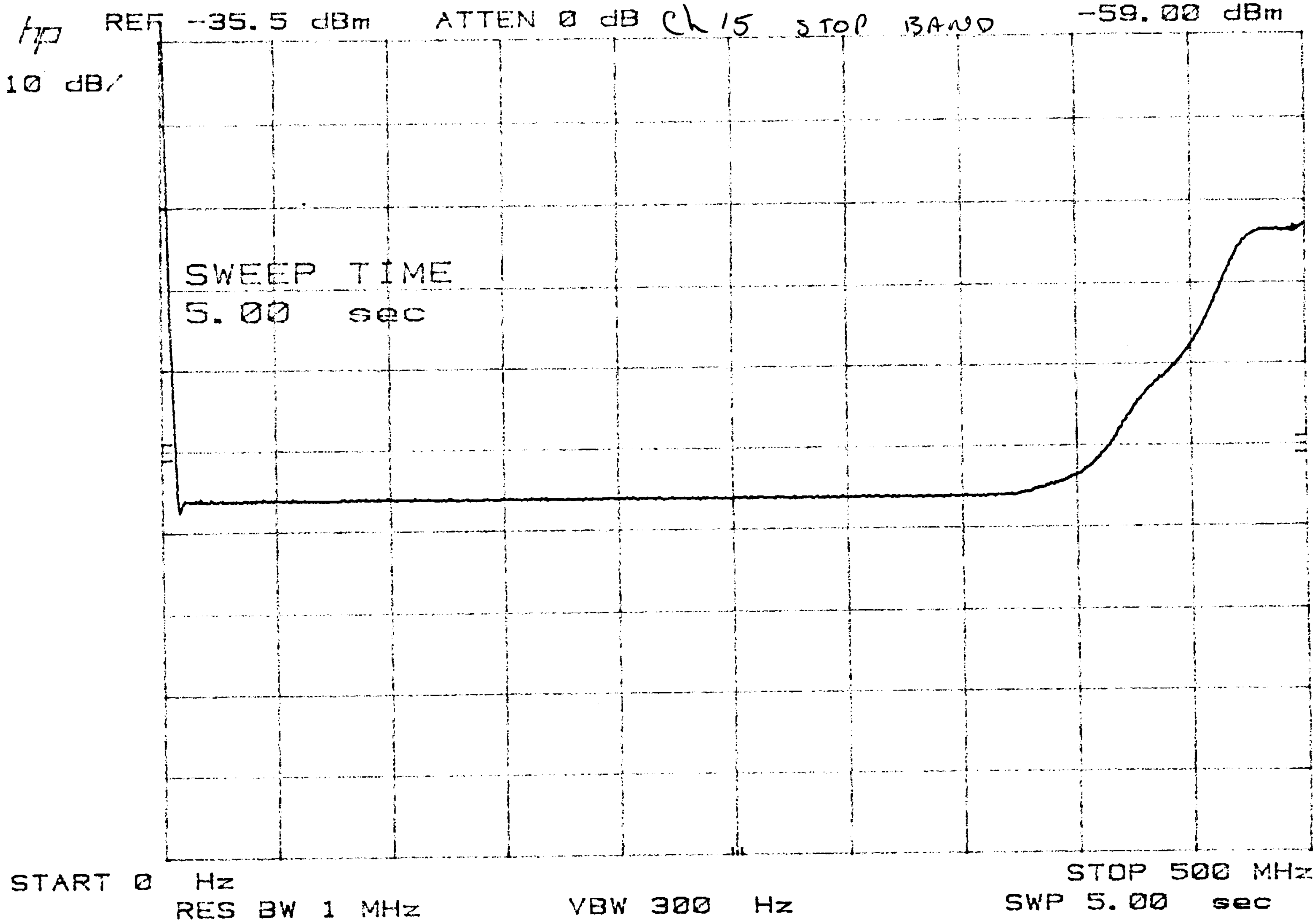


CENTER 1.00 GHz SPAN 1.50 GHz

RES BW 1 MHz VBW 300 Hz SWP 15.0 sec

ch. 15 ATP P/N 1356424-2
S/W F06
TDS 7

FOR REFERENCE ONLY



TEST DATA SHEET 10 (Sheet 1 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [illegible] Baseplate Temperature (T_B) 27.9 °C
Signature

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	6	9.97	181	22.0	-1.075	.000178	-194.0	-.7732	.000202
				22.0	-1.075	.000217	-194.0	-.7684	.000222
				22.0	-1.076	.000182	-194.0	-.7653	.000199
				22.0	-1.077	.000163	-194.0	-.7635	.000221
				22.0	-1.077	.000194	-194.0	-.7605	.000220
				22.0	-1.078	.000221	-194.0	-.7577	.000276
				22.0	-1.079	.000201	-194.0	-.7583	.000239
				22.0	-1.079	.000188	-194.0	-.7574	.000218
				22.0	-1.079	.000208	-194.0	-.7575	.000258
				22.0	-1.080	.000195	-194.0	-.7592	.000348
Mixer/ Amps	All	9.93	249						
IF Amps	All	7.95	267						

SO# 622627

Part No.: 135642 9-2

Serial No.: F06

Test Engineer: [illegible]

Quality Assurance: QA 200

Date: 6/1/99

TEST DATA SHEET 10 (Sheet 16 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Gary Lambert (Signature) Baseplate Temperature (T_B) 28 °C

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
6		4.21				.049			
		4.13				.072			
		4.08				.039			
		4.05				.068			
		4.00				.023			
		3.96				.074			
		3.96				.042			
		3.95				.021			
		3.94				.056			
		3.96				.026			
	5.15		4.03	P	.08		.047	.053	P

Pass = P, Fail = F

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: Gary Lambert
Quality Assurance: TA 200
Date: 6/1/99

FOR REFERENCE ONLY

AMSU-A TEST

A1-1 F06 ATP: CH6 NF & NPS: TB=28C: 5/28/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.07481264	.00017753	4.21017432	.04940315
2	COLD TEST	79.15	-.77319582	.00020238		
3	WARM TEST	295.15	-1.07522558	.00021663	4.13723363	.07255957
4	COLD TEST	79.15	-.76841719	.00022236		
5	WARM TEST	295.15	-1.07595592	.00018207	4.08539978	.03935754
6	COLD TEST	79.15	-.76527825	.00019937		
7	WARM TEST	295.15	-1.07661687	.00016349	4.05378618	.06783720
8	COLD TEST	79.15	-.76349294	.00022090		
9	WARM TEST	295.15	-1.07727949	.00019374	4.00237729	.02251118
10	COLD TEST	79.15	-.76025815	.00022025		
11	WARM TEST	295.15	-1.07778360	.00022052	3.96216152	.07438180
12	COLD TEST	79.15	-.75768417	.00027610		
13	WARM TEST	295.15	-1.07852778	.00020093	3.96321061	.04182252
14	COLD TEST	79.15	-.75828415	.00023888		
15	WARM TEST	295.15	-1.07879510	.00018847	3.94877828	.02149874
16	COLD TEST	79.15	-.75741341	.00021785		
17	WARM TEST	295.15	-1.07944755	.00020859	3.94321239	.05580475
18	COLD TEST	79.15	-.75746203	.00025784		
19	WARM TEST	295.15	-1.07986022	.00019517	3.96327142	.02585336
20	COLD TEST	79.15	-.75922541	.00034762		

CH. 6 .193 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.02783965528

NOISE POWER STABILITY (K) = .0471029799417

NOISE POWER STABILITY DELTA (K) = .0528830594374

NPS_MAX (K) = .0743817962352 NPS_MIN (K) = .0214987367978

INTEGRATION TIME = .165

S/O: 622627
P/N: 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 2 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: ______ Baseplate Temperature (T_B) 27.9 °C
Signature

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	7	9.93	176	22.0	-1.105	.000179	-194.0	-.7882	.000160
				22.0	-1.104	.000194	-194.0	-.7853	.000465
				22.0	-1.104	.000199	-194.0	-.7808	.000218
				22.0	-1.104	.000205	-194.0	-.7808	.000415
				22.0	-1.104	.000220	-194.0	-.7814	.000229
				22.0	-1.104	.000196	-194.0	-.7789	.000261
				22.0	-1.105	.000212	-194.0	-.7760	.000248
				22.0	-1.105	.000192	-194.0	-.7734	.000258
				22.0	-1.105	.000210	-194.0	-.7749	.000272
				22.0	-1.105	.000193	-194.0	-.7730	.000232
Mixer/ Amps	All	9.93	249						
IF Amps	All	7.95	267						

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: ______
Quality Assurance: TA 200
Date: 6-1-99

TEST DATA SHEET 10 (Sheet 17 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: J. GAMBLES
Signature

Baseplate Temperature (T_B) 27 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
7		4.12				.055			
		4.09				.022			
		4.03				.019			
		4.02				.040			
		4.03				.066			
		4.00				.006			
		3.95				.052			
		3.92				.029			
		3.94				.048			
		3.90				.025			
	5.15		4.00	P	.08		.036	.060	P

Pass = P, Fail = F

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: [signature]
Quality Assurance: QA 200
Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-1 F06 ATP. CH. 7 NF & NPS: 5/28/99 : TB=27

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.10467908	.00017940	----------	----------
2	COLD TEST	79.15	-.78821093	.00016028	4.11985284	.05501261
3	WARM TEST	295.15	-1.10360238	.00019388	----------	----------
4	COLD TEST	79.15	-.78538660	.00046469	4.09150657	.02165142
5	WARM TEST	295.15	-1.10383078	.00019650	----------	----------
6	COLD TEST	79.15	-.78079008	.00021795	4.02660045	.01869931
7	WARM TEST	295.15	-1.10405362	.00020566	----------	----------
8	COLD TEST	79.15	-.78078842	.00041492	4.02444489	.04042475
9	WARM TEST	295.15	-1.10416250	.00022000	----------	----------
10	COLD TEST	79.15	-.78141784	.00022880	4.03192428	.06609632
11	WARM TEST	295.15	-1.10441616	.00019639	----------	----------
12	COLD TEST	79.15	-.77890403	.00026095	3.99558646	.00636664
13	WARM TEST	295.15	-1.10489250	.00021190	----------	----------
14	COLD TEST	79.15	-.77600720	.00024837	3.95238114	.05173466
15	WARM TEST	295.15	-1.10504164	.00019153	----------	----------
16	COLD TEST	79.15	-.77343202	.00025831	3.91688787	.02929014
17	WARM TEST	295.15	-1.10499517	.00020980	----------	----------
18	COLD TEST	79.15	-.77488023	.00027216	3.93646436	.04768799
19	WARM TEST	295.15	-1.10520618	.00019288	----------	----------
20	COLD TEST	79.15	-.77297629	.00023177	3.90936481	.02530882

CH. 7 .191.2 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.0010374828

NOISE POWER STABILITY (K) = .0362272658519

NOISE POWER STABILITY DELTA (K) = .0597296810856

NPS_MAX (K) = .0660963186915 NPS_MIN (K) = .0063666376058 7

INTEGRATION TIME = .165

S/N 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 3 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [signature]
Signature

Baseplate Temperature (T_B) 27.8 °C PLO No. 1

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V)		T_C(°C)	V_C (V)	
					Mean	Standard Deviation		Mean	Standard Deviation
		Positive		22.0	-.9357	.000177	-194.0	-.6927	.000191
				22.0	-.9347	.000189	-194.0	-.6917	.000164
				22.0	-.9344	.000188	-194.0	-.6891	.000173
		+15.13	523.57	22.0	-.9341	.000204	-194.0	-.6906	.000125
LO	9	Negative		22.0	-.9338	.000238	-194.0	-.6902	.000350
		-15.13	-68.31	22.0	-.9337	.000172	-194.0	-.6881	.000207
				22.0	-.9338	.000182	-194.0	-.6884	.000298
				22.0	-.9339	.000194	-194.0	-.6874	.000178
				22.0	-.9337	.000183	-194.0	-.6875	.000280
				22.0	-.9337	.000203	-194.0	-.6873	.000230
Mixer/ Amps	All	9.93	249.2						
IF Amps	All	7.95	266.7						

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: [signature]
Quality Assurance: 003
Date: 6/1/99

TEST DATA SHEET 10 (Sheet 18 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Gary Lamb (Signature) Baseplate Temperature (T_B) 28 °C PLO No. 1

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
9		4.55				.050			
		4.54				.034			
		4.50				.029			
		4.53				.076			
		4.52				.132			
		4.49				.061			
		4.49				.031			
		4.48				.051			
		4.48				.019			
		4.48				.073			
	4.7		4.51	P	.08		.056	.11	P

Pass = P, Fail = F

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: Gary Lamb
Quality Assurance: QA 200
Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

PCO #1

A1-1 F06 ATP, CH 9 NF & NPS, TB = 28, 5/28/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-.93574138	.00017702	----------	----------
2	COLD TEST	79.15	-.69274923	.00019053	4.54922082	.04966433
3	WARM TEST	295.15	-.93474459	.00018940	----------	----------
4	COLD TEST	79.15	-.69170614	.00016440	4.54373094	.03426935
5	WARM TEST	295.15	-.93442377	.00018827	----------	----------
6	COLD TEST	79.15	-.68912807	.00017307	4.50182935	.02897541
7	WARM TEST	295.15	-.93409656	.00020437	----------	----------
8	COLD TEST	79.15	-.69059598	.00012518	4.53239828	.07646589
9	WARM TEST	295.15	-.93380180	.00023802	----------	----------
10	COLD TEST	79.15	-.69021774	.00034985	4.52952110	.13253490
11	WARM TEST	295.15	-.93365069	.00017192	----------	----------
12	COLD TEST	79.15	-.68806954	.00020695	4.49312946	.06061441
13	WARM TEST	295.15	-.93383597	.00018196	----------	----------
14	COLD TEST	79.15	-.68845635	.00029848	4.49758459	.03063203
15	WARM TEST	295.15	-.93393514	.00019437	----------	----------
16	COLD TEST	79.15	-.68740661	.00017766	4.47763345	.05147473
17	WARM TEST	295.15	-.93372291	.00018392	----------	----------
18	COLD TEST	79.15	-.68753025	.00027995	4.48259843	.01928925
19	WARM TEST	295.15	-.93367749	.00020320	----------	----------
20	COLD TEST	79.15	-.68728736	.00022964	4.47888174	.07324890

CH. 9 .154 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.50873128957

NOISE POWER STABILITY (K) = .0557169205816

NOISE POWER STABILITY DELTA (K) = .113245651048

NPS_MAX (K) = .132534897969 NPS_MIN (K) = .0192892469208

INTEGRATION TIME = .165

S/O 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 4 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: ______
Signature

Baseplate Temperature (T_B) 28 °C PLO No. 1

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	10	Positive 15.13	523.57	22.0	-.9859	.00274 ~~.000177~~	-194.0	-.7189 ~~-.6927~~	.000223 ~~.000191~~
				22.0	-.9856 ~~-.9347~~	.000304 .000189	-194.0	-.71612 ~~-.6917~~	.000224 ~~.000164~~
				22.0	-.9854 ~~-.8979~~	.000326 ~~.0007964~~	-194.0	-.7170	.000271
				22.0	-.9853	.000280	-194.0	-.7142	.000208
		Negative -15.13	-68.31	22.0	-.9856	.000317	-194.0	-.71398	.000224
				22.0	-.9856	.000314	-194.0	-.7124	.000195
				22.0	-.9856	.000264	-194.0	-.7133	.000224
				22.0	-.9856	.000263	-194.0	-.7124	.000212
				22.0	-.9858	.000291	-194.0	-.7108	.000257
				22.0	-.9859	.000277	-194.0	-.7113	.000229
Mixer/Amps	All	9.93	249.2						
IF Amps	All	7.95	266.7						

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: ______
Quality Assurance: 002
Date: 6-1-99

TEST DATA SHEET 10 (Sheet 19 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Gary Lamb
Signature
Baseplate Temperature (T_B) 28 °C PLO No. 1

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
10		4.37				.048			
		4.32				.094			
		4.34				.011			
		4.30				.133			
		4.29				.118			
		4.26				.110			
		4.28				.076			
		4.26				.076			
		4.23				.061			
		4.24				.034			
	4.7		4.29	P	0.12		.076	.122	P

Pass = P, Fail = F

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: Gary Lamb

Quality Assurance: IA 200

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**
PLO #1

A1-1 F06 ATP. CH10 NF & NPS. TB = 27: 5/28/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-.98591287	.00027441	----------	---------
2	COLD TEST	79.15	-.71893736	.00022310	4.36609813	.04758456
3	WARM TEST	295.15	-.98566382	.00030409	----------	---------
4	COLD TEST	79.15	-.71612445	.00022409	4.32321491	.09397330
5	WARM TEST	295.15	-.98543101	.00032581	----------	---------
6	COLD TEST	79.15	-.71702212	.00027142	4.34055505	.13337896
7	WARM TEST	295.15	-.98531129	.00028010	----------	---------
8	COLD TEST	79.15	-.71423235	.00020781	4.29675267	.01146468
9	WARM TEST	295.15	-.98562767	.00031741	----------	---------
10	COLD TEST	79.15	-.71398182	.00022385	4.28902310	.11804135
11	WARM TEST	295.15	-.98560483	.00031359	----------	---------
12	COLD TEST	79.15	-.71245468	.00019511	4.26477902	.11079688
13	WARM TEST	295.15	-.98565588	.00026358	----------	---------
14	COLD TEST	79.15	-.71329759	.00022371	4.27769772	.07624580
15	WARM TEST	295.15	-.98564157	.00026348	----------	---------
16	COLD TEST	79.15	-.71249207	.00021165	4.26495254	.07623503
17	WARM TEST	295.15	-.98585175	.00029126	----------	---------
18	COLD TEST	79.15	-.71083718	.00025718	4.23613450	.06126350
19	WARM TEST	295.15	-.98586345	.00027724	----------	---------
20	COLD TEST	79.15	-.71132332	.00022893	4.24373529	.03419300

CH. 10 .74.6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.29047821722

NOISE POWER STABILITY (K) = .0763177054919

NOISE POWER STABILITY DELTA (K) = .121914280538

NPS_MAX (K) = .133378961532 NPS_MIN (K) = .0114646809941

INTEGRATION TIME = .165

S/N 622627
P/N 1356429
TDS 10

TEST DATA SHEET 10 (Sheet 5 of 30)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Gary Hamlin (Signature) Baseplate Temperature (T_B) 28 °C PLO No. 1

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	11	Positive 15.13	520.4	22.0	-1.0103	.000313	-194	-.7477	.000238
				22.0	-1.0104	.000292	-194	-.7488	.000278
				22.0	-1.0108	.000372	-194	-.7480	.000245
				22.0	-1.0114	.000332	-194	-.7460	.000262
		Negative -15.13	-67.94	22.0	-1.0119	.000299	-194	-.7483	.000262
				22.0	-1.0123	.000354	-194	-.7479	.000276
				22.0	-1.0128	.000289	-194	-.7464	.000243
				22.0	-1.0129	.000353	-194	.7462	.000288
				22.0	-1.0133	.000297	-194	-.7458	.000251
				22.0	-1.0136	.000308	-194	-.7465	.000362
Mixer/ Amps	All	9.94	248.7						
IF Amps	All	7.96	263.						

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: Gary Hamlin

Quality Assurance: QA 200

Date: 6-1-99

TEST DATA SHEET 10 (Sheet 25 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: ____ Signature   Baseplate Temperature (T_B) 28.0 °C   PLO No. 2

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
10		4.22				.04			
		4.37				.08			
		4.42				.08			
		4.43				.07			
		4.45				.09			
		4.42				.07			
		4.45				.02			
		4.42				.10			
		4.46				.05			
		4.52				.015			
	4.7		4.42	P	0.12		.064	.09	P

Pass = P, Fail = F

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: ____

Quality Assurance: ____ QA 200

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-1 F06 ATP, CH 10 NF & NPS, PLO #2, TB = 27, 5/28/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-.98465808	.00027363	----------	---------
2	COLD TEST	79.15	-.70871191	.00342478	4.21605240	.04472320
3	WARM TEST	295.15	-.98376198	.00029438	----------	---------
4	COLD TEST	79.15	-.71760936	.00034842	4.37004550	.07552666
5	WARM TEST	295.15	-.98360225	.00029705	----------	---------
6	COLD TEST	79.15	-.72065408	.00019990	4.42228105	.08323359
7	WARM TEST	295.15	-.98352806	.00026438	----------	---------
8	COLD TEST	79.15	-.72087253	.00031860	4.42681849	.07385378
9	WARM TEST	295.15	-.98345163	.00030135	----------	---------
10	COLD TEST	79.15	-.72201943	.00021255	4.44688321	.09370754
11	WARM TEST	295.15	-.98352734	.00029402	----------	---------
12	COLD TEST	79.15	-.72024364	.00020649	4.41637452	.07557536
13	WARM TEST	295.15	-.98362830	.00028026	----------	---------
14	COLD TEST	79.15	-.72216937	.00027885	4.44722146	.01972985
15	WARM TEST	295.15	-.98356996	.00030930	----------	---------
16	COLD TEST	79.15	-.72070246	.00021750	4.42347874	.10932635
17	WARM TEST	295.15	-.98345817	.00028573	----------	---------
18	COLD TEST	79.15	-.72268303	.00025490	4.45791069	.05035304
19	WARM TEST	295.15	-.98339791	.00027859	----------	---------
20	COLD TEST	79.15	-.72642016	.00024094	4.52175198	.01525691

CH. 10 ,75.2 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.41553409894

NOISE POWER STABILITY (K) = .0641286277288

NOISE POWER STABILITY DELTA (K) = .0940694363017

NPS_MAX (K) = .109326346934 NPS_MIN (K) = .0152569106327

INTEGRATION TIME = .165

S/O 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 11 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [signature] Baseplate Temperature (T_B) 28.0 °C PLO No. 2
Signature

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	11	Positive +15.12	684.62	22.0	-1.007	.000313	-194.0	-.7184	.000232
				22.0	-1.007	.000299	-194.0	-.7189	.000256
				22.0	-1.006	.000311	-194.0	-.7193	.000266
				22.0	-1.006	.000301	-194.0	-.7188	.000226
		Negative -15.13	-67.32	22.0	-1.007	.000311	-194.0	-.7192	.000257
				22.0	-1.007	.000335	-194.0	-.7192	.000237
				22.0	-1.007	.000287	-194.0	-.7208	.000274
				22.0	-1.008	.000271	-194.0	-.7264	.000252
				22.0	-1.008	.000248	-194.0	-.7225	.000268
				22.0	-1.007	.000311	-194.0	-.7243	.000217
Mixer/Amps	All	9.94	249.2						
IF Amps	All	7.94	266.8						

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: [signature]
Quality Assurance: TA 200
Date: 6/1/99

TEST DATA SHEET 10 (Sheet 20 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Gary Lamb Baseplate Temperature (T_B) 28 °C PLO No. 1
Signature

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
11		4.54				.076			
		4.56				.052			
		4.54				.18			
		4.50				.12			
		4.54				.007			
		4.52				.154			
		4.49				.063			
		4.49				.152			
		4.48				.031			
		4.48				.060			
	4.7		4.52	P	.12		.089	.175	P

Pass = P, Fail = F

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: Gary Lamb
Quality Assurance: QA 200
Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

PLO #1

A1-1 F06 ATP. CH 11 NF & NPS. TB = 27: 5/28/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.01028408	.00031267	----------	----------
2	COLD TEST	79.15	-.74771925	.00023858	4.54563226	.07641590
3	WARM TEST	295.15	-1.01035128	.00029190	----------	----------
4	COLD TEST	79.15	-.74880770	.00027763	4.56295325	.05182638
5	WARM TEST	295.15	-1.01075665	.00037191	----------	----------
6	COLD TEST	79.15	-.74798849	.00024520	4.54429320	.18214568
7	WARM TEST	295.15	-1.01138533	.00033153	----------	----------
8	COLD TEST	79.15	-.74596879	.00026221	4.50318512	.11675821
9	WARM TEST	295.15	-1.01186288	.00029888	----------	----------
10	COLD TEST	79.15	-.74829362	.00026211	4.53577066	.00752143
11	WARM TEST	295.15	-1.01232337	.00035364	----------	----------
12	COLD TEST	79.15	-.74794685	.00027557	4.52439471	.15408499
13	WARM TEST	295.15	-1.01276134	.00028895	----------	----------
14	COLD TEST	79.15	-.74635297	.00024336	4.49282611	.06321792
15	WARM TEST	295.15	-1.01289446	.00035305	----------	----------
16	COLD TEST	79.15	-.74615357	.00022828	4.48794897	.15159855
17	WARM TEST	295.15	-1.01333679	.00029697	----------	----------
18	COLD TEST	79.15	-.74581438	.00025052	4.47707090	.03109729
19	WARM TEST	295.15	-1.01357944	.00030846	----------	----------
20	COLD TEST	79.15	-.74649315	.00036234	4.48524788	.05960622

CH. 11 .69.4 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.51602782505

NOISE POWER STABILITY (K) = .0894272565447

NOISE POWER STABILITY DELTA (K) = .174624242902

NPS_MAX (K) = .182145675757 NPS_MIN (K) = .00752143285519

INTEGRATION TIME = .165

S/N 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 6 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Gary Lamb (Signature) Baseplate Temperature (T_B) 28 °C PLO No. 1

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	12	Positive 15.13	524	22.0	-1.0059	.000390	194	-.7396	.000868
				22.0	-1.0056	.000447	194	-.7449	.000465
				22.0	-1.0064	.000431	194	-.7442	.000345
				22.0	-1.0072	.000418	194	-.7449	.000359
				22.0	-1.0092	.000445	194	-.7458	.000337
		Negative -15.13	-68	22.0	-1.0[illegible]	.000447	194	-.7461	.000351
				22.0	-1.0105	.000460	194	-.7467	.000315
				22.0	-1.0106	.000434	194	-.7467	.000420
				22.0	-1.0107	.000468	194	-.7439	.000336
				22.0	-1.0109	.000468	194	-.7420	.000345
Mixer/ Amps	All	9.93	249						
IF Amps	All	7.95	267						

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: Gary Lamb

Quality Assurance: 003 V2

Date: 6-1-99

TEST DATA SHEET 10 (Sheet 21 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Mary Lamb (Signature) Baseplate Temperature (T_B) 28 °C PLO No. 1

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
12		4.46				.172			
		4.56				.045			
		4.53				.090			
		4.53				.124			
		4.53				.017			
		4.52				.026			
		4.53				.092			
		4.53				.082			
		4.48				.114			
		4.44				.114			
	4.7		4.51	P	0.18		.088	.155	P

Pass = P, Fail = F

SO# 622627

Part No.: 135629-2

Serial No.: F06

Test Engineer: Mary Lamb

Quality Assurance: QA 800

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**
PLO #1

A1-1 F06 ATP, CH 12 NF & NPS, TB = 29, 5/28/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.00592178	.00039020	----------	---------
2	COLD TEST	79.15	-.73961616	.00086796	4.46489668	.17193559
3	WARM TEST	295.15	-1.00561622	.00044728	----------	---------
4	COLD TEST	79.15	-.74492976	.00046531	4.55676969	.04532193
5	WARM TEST	295.15	-1.00636078	.00043057	----------	---------
6	COLD TEST	79.15	-.74423061	.00034498	4.53586915	.09015058
7	WARM TEST	295.15	-1.00716180	.00041832	----------	---------
8	COLD TEST	79.15	-.74491813	.00035890	4.53745435	.12405776
9	WARM TEST	295.15	-1.00921725	.00044502	----------	---------
10	COLD TEST	79.15	-.74582639	.00033710	4.52728842	.01715708
11	WARM TEST	295.15	-1.00999880	.00044704	----------	---------
12	COLD TEST	79.15	-.74605351	.00035098	4.52148208	.02653949
13	WARM TEST	295.15	-1.01051683	.00046009	----------	---------
14	COLD TEST	79.15	-.74666477	.00031541	4.52526688	.09222026
15	WARM TEST	295.15	-1.01063807	.00043457	----------	---------
16	COLD TEST	79.15	-.74674149	.00041980	4.52505380	.08262023
17	WARM TEST	295.15	-1.01066144	.00046784	----------	---------
18	COLD TEST	79.15	-.74392725	.00033560	4.47841313	.11401377
19	WARM TEST	295.15	-1.01086601	.00046814	----------	---------
20	COLD TEST	79.15	-.74198344	.00034540	4.44423650	.11368272

CH. 12 ,31.1 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.51180898626

NOISE POWER STABILITY (K) = .087769941083

NOISE POWER STABILITY DELTA (K) = .154778507746

NPS_MAX (K) = .171935589508 NPS_MIN (K) = .0171570817615

INTEGRATION TIME = .165

S/O 622627
P/W 1356429-4
TDS 10

TEST DATA SHEET 10 (Sheet 7 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: ______________ Baseplate Temperature (T_B) 28 °C PLO No. 1
Signature

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	13	Positive 15.13	530	22.0	-1.0524	.000684	19.4	-.7760	.000480
				22.0	-1.0502	.000656	194	-.7753	.000518
				22.0	-1.0496	.000730	194	-.7742	.000490
				22.0	-1.0493	.000646	194	-.7718	.000488
				22.0	-1.0495	.000622	194	-.7719	.000495
		Negative 15.13	-65	22.0	-1.0493	.000674	194	-.7728	.000423
				22.0	-1.0498	.000695	194	-.7742	.000546
				22.0	-1.0499	.000672	194	-.7746	.000461
				22.0	-1.0501	.000673	194	-.7725	.000478
				22.0	-1.0504	.000[illegible]14	194	-.7727	.000490
Mixer/Amps	All	9.94	250						
IF Amps	All	7.95	268						

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: ______________

Quality Assurance: 003

Date: 6/1/99

TEST DATA SHEET 10 (Sheet 22 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [signature] Baseplate Temperature (T_B) 28 °C PLO No. 1
Signature

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
13		4.50				.157			
		4.51				.055			
		4.50				.257			
		4.47				.068			
		4.47				.152			
		4.49				.134			
		4.50				.189			
		4.50				.128			
		4.47				.128			
		4.47				.226			
	4.7		4.49	P	0.24		.149	.201	P

Pass = P, Fail = F

SO# 622627
Part No.: 356429-2

Serial No.: F06

Test Engineer: [signature]

Quality Assurance: ZA 200

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

PLO tti

A1-1 F06 ATP. CH 13 NF & NPS. TB = 28 . 5/28/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.05245682	.00068420	----------	---------
2	COLD TEST	79.15	-.77604795	.00047993	4.49980043	.15734187
3	WARM TEST	295.15	-1.05015265	.00065625	----------	---------
4	COLD TEST	79.15	-.77529793	.00051826	4.51486372	.05525408
5	WARM TEST	295.15	-1.04957566	.00072955	----------	---------
6	COLD TEST	79.15	-.77423482	.00049030	4.50473936	.25661068
7	WARM TEST	295.15	-1.04929558	.00064601	----------	---------
8	COLD TEST	79.15	-.77182110	.00048788	4.46983691	.06829533
9	WARM TEST	295.15	-1.04948099	.00062179	----------	---------
10	COLD TEST	79.15	-.77187341	.00049475	4.46851312	.15276008
11	WARM TEST	295.15	-1.04934651	.00067418	----------	---------
12	COLD TEST	79.15	-.77284674	.00042325	4.48542853	.13407867
13	WARM TEST	295.15	-1.04984640	.00069529	----------	---------
14	COLD TEST	79.15	-.77424462	.00054630	4.50172674	.18869198
15	WARM TEST	295.15	-1.04988264	.00067233	----------	---------
16	COLD TEST	79.15	-.77445881	.00046091	4.50470035	.12773121
17	WARM TEST	295.15	-1.05012724	.00067274	----------	---------
18	COLD TEST	79.15	-.77252840	.00047789	4.47134129	.12757452
19	WARM TEST	295.15	-1.05036229	.00071409	----------	---------
20	COLD TEST	79.15	-.77269985	.00049030	4.47131819	.22550908

CH. 13 .15.7 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.48925985265

NOISE POWER STABILITY (K) = .149384749025

NOISE POWER STABILITY DELTA (K) = .201356607242

NPS_MAX (K) = .256610684174 NPS_MIN (K) = .0552540769314

INTEGRATION TIME = .165

S/O 622627

P/N 1356429-2

TDS 10

TEST DATA SHEET 10 (Sheet 8 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: ____________ Signature   Baseplate Temperature (T_B) 28 °C   PLO No. 1

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	14	Positive 15.13	524	22.0	-.9969	.00105	194	-.7353	.000679
				22.0	-.9942	.000976	194	-.7330	.000637
				22.0	-.9934	.00101	194	-.7312	.000767
				22.0	-.9930	.000994	194	-.7311	.000852
				22.0	-.9926	.000986	194	-.7340	.000847
		Negative -15.13	-68	22.0	-.9929	.00101	194	-.7341	.000840
				22.0	-.9932	.000991	194	-.7349	.000669
				22.0	-.9933	.00104	194	-.7339	.000691
				22.0	-.9934	.00100	194	-.7339	.000666
				22.0	-.9933	.000989	194	-.7335	.000739
Mixer/Amps	All	9.93	249						
IF Amps	All	7.95	267						

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: ____________
Quality Assurance: 24 200
Date: 6/1/99

TEST DATA SHEET 10 (Sheet 23 of 30)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [illegible]
Signature

Baseplate Temperature (T_B) 28 °C PLO No. 1

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
14		4.50				.27			
		4.50				.18			
		4.48				.12			
		4.48				.07			
		4.53				.12			
		4.53				.13			
		4.54				.10			
		4.52				.24			
		4.52				.09			
		4.51				.11			
	4.7		4.51	P	0.36		.14	.20	P

Pass = P, Fail = F

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: [illegible]

Quality Assurance: QA 200

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-1 F06 ATP, CH 14 NF & NPS, TB = 28, 5/28/99
PLO #1

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-.99689887	.00105293	----------	---------
2	COLD TEST	79.15	-.73532333	.00067899	4.50384235	.26735294
3	WARM TEST	295.15	-.99418508	.00097572	----------	---------
4	COLD TEST	79.15	-.73301004	.00063737	4.49862563	.17806867
5	WARM TEST	295.15	-.99342646	.00100984	----------	---------
6	COLD TEST	79.15	-.73121745	.00076782	4.47802157	.12471008
7	WARM TEST	295.15	-.99304421	.00099454	----------	---------
8	COLD TEST	79.15	-.73110415	.00085235	4.48082477	.06895867
9	WARM TEST	295.15	-.99265006	.00098634	----------	---------
10	COLD TEST	79.15	-.73396269	.00084668	4.53369819	.12507975
11	WARM TEST	295.15	-.99294532	.00101005	----------	---------
12	COLD TEST	79.15	-.73411194	.00083984	4.53253197	.13010432
13	WARM TEST	295.15	-.99317247	.00099120	----------	---------
14	COLD TEST	79.15	-.73494736	.00066886	4.54381352	.09851447
15	WARM TEST	295.15	-.99330843	.00103964	----------	---------
16	COLD TEST	79.15	-.73392949	.00069050	4.52492825	.24166569
17	WARM TEST	295.15	-.99342833	.00100426	----------	---------
18	COLD TEST	79.15	-.73391246	.00066608	4.52314921	.08989609
19	WARM TEST	295.15	-.99330501	.00098912	----------	---------
20	COLD TEST	79.15	-.73354274	.00073949	4.51845944	.11235292

CH. 14 .6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.51384215122

NOISE POWER STABILITY (K) = .143670361061

NOISE POWER STABILITY DELTA (K) = .198394271938

NPS_MAX (K) = .267352944163 NPS_MIN (K) = .0689586722245

INTEGRATION TIME = .165

S/O 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 9 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [illegible] Baseplate Temperature (T_B) 27.9 °C PLO No. 2
Signature

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	9	Positive		22.0	-.9389	.000183	-194.0	-.6708	.000217
				22.0	-.9376	.000187	-194.0	-.6716	.000155
				22.0	-.9370	.000199	-194.0	-.6722	.000139
		+15.11	686.61	22.0	-.9363	.000174	-194.0	-.6731	.000207
		Negative		22.0	-.9360	.000203	-194.0	-.6729	.000140
		-15.13	-67.32	22.0	-.9352	.000198	-194.0	-.6727	.000178
				22.0	-.9348	.000202	-194.0	-.6760	.000227
				22.0	-.9348	.000193	-194.0	-.6768	.000314
				22.0	-.9345	.000205	-194.0	-.6770	.000176
				22.0	-.9339	.000191	-194.0	-.6772	.000243
Mixer/ Amps	All	9.93	249.1						
IF Amps	All	7.94	266.7						

SO #622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: [illegible]
Quality Assurance: QA 20?
Date: 6/1/99

TEST DATA SHEET 10 (Sheet 24 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: ____________ Baseplate Temperature (T_B) 28.0 °C PLO No. 2
Signature

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
9		4.13				.03			
		4.16				.02			
		4.18				.06			
		4.20				.05			
		4.20				.07			
		4.21				.06			
		4.27				.07			
		4.28				.04			
		4.29				.07			
		4.30				.04			
	4.7		4.22	P	.08		.05	.06	P

Pass = P, Fail = F

SO # 622627

Part No.: 135629-2

Serial No.: F06

Test Engineer: ____________

Quality Assurance: TA 200

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-1 F06 ATP, CH 9 NF & NPS, PLO#2, TB = 27, 5/29/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-.93893120	.00018341	----------	---------
2	COLD TEST	79.15	-.67084243	.00021709	4.13444271	.02617599
3	WARM TEST	295.15	-.93755849	.00018706	----------	---------
4	COLD TEST	79.15	-.67155355	.00015453	4.16216590	.01623989
5	WARM TEST	295.15	-.93702201	.00019933	----------	---------
6	COLD TEST	79.15	-.67215938	.00013864	4.17848039	.05869807
7	WARM TEST	295.15	-.93633844	.00017350	----------	---------
8	COLD TEST	79.15	-.67308718	.00020683	4.20197123	.05444247
9	WARM TEST	295.15	-.93595403	.00020304	----------	---------
10	COLD TEST	79.15	-.67285253	.00013966	4.20266388	.06745856
11	WARM TEST	295.15	-.93520574	.00019796	----------	---------
12	COLD TEST	79.15	-.67268653	.00017832	4.20885421	.05681383
13	WARM TEST	295.15	-.93478983	.00020162	----------	---------
14	COLD TEST	79.15	-.67599743	.00022654	4.26942055	.06605006
15	WARM TEST	295.15	-.93476971	.00019269	----------	---------
16	COLD TEST	79.15	-.67680330	.00031404	4.28330216	.04382841
17	WARM TEST	295.15	-.93446194	.00020525	----------	---------
18	COLD TEST	79.15	-.67700843	.00017624	4.29056309	.07392629
19	WARM TEST	295.15	-.93386378	.00019077	----------	---------
20	COLD TEST	79.15	-.67721826	.00024274	4.30150544	.03831415

CH. 9 .154 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.2236950359

NOISE POWER STABILITY (K) = .0501947716254

NOISE POWER STABILITY DELTA (K) = .0576864006853

NPS_MAX (K) = .0739262859507 NPS_MIN (K) = .0162398852654

INTEGRATION TIME = .165

S/O 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 10 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: James F. Hamblen (Signature) Baseplate Temperature (T_B) 27.9 °C PLO No. 2

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	10	Positive		22.0	-.9847	.000274	-194.0	-.7087	.00344
				22.0	-.9838	.000294	-194.0	-.7176	.000348
				22.0	-.9836	.000297	-194.0	-.7206	.000200
		+15.11	686.58	22.0	-.9835	.000264	-194.0	-.7209	.000319
		Negative		22.0	-.9835	.000301	-194.0	-.7220	.000213
		-15.12	-67.30	22.0	-.9835	.000294	-194.0	-.7202	.000206
				22.0	-.9834	.000280	-194.0	-.7222	.000279
				22.0	-.9836	.000309	-194.0	-.7207	.000218
				22.0	-.9835	.000286	-194.0	-.7227	.000255
				22.0	-.9834	.000279	-194.0	-.7264	.000241
Mixer/ Amps	All	9.93	249.2						
IF Amps	All	7.94	266.8						

SO# 622627
Part No.: 135642 9-2
Serial No.: F06

Test Engineer: James F. Hamblen
Quality Assurance: 7A 200
Date: 6/1/99

TEST DATA SHEET 10 (Sheet 26 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: ______ Baseplate Temperature (T_B) 27.9 °C PLO No. 2
Signature

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
11		4.12				.07			
		4.13				.02			
		4.14				.07			
		4.13				.03			
		4.13				.07			
		4.13				.11			
		4.15				.06			
		4.24				.09			
		4.17				.12			
		4.20				.07			
	4.7		4.15	P	.12		.07	.10	P

Pass = P, Fail = F

SO# 622627

Part No.: 135629-2

Serial No.: F06

Test Engineer: ______

Quality Assurance: 003

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-1 F06 ATP, CH 11 NF & NPS, PLO # 2 , TB = 27, 5/29/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.00684978	.00031315	----------	----------
2	COLD TEST	79.15	-.71835987	.00023298	4.11912714	.07311259
3	WARM TEST	295.15	-1.00653461	.00029922	----------	----------
4	COLD TEST	79.15	-.71893819	.00025563	4.13132228	.02443773
5	WARM TEST	295.15	-1.00657042	.00031102	----------	----------
6	COLD TEST	79.15	-.71933743	.00026639	4.13700706	.06831935
7	WARM TEST	295.15	-1.00637681	.00030063	----------	----------
8	COLD TEST	79.15	-.71875921	.00022560	4.13031455	.03303336
9	WARM TEST	295.15	-1.00667405	.00031133	----------	----------
10	COLD TEST	79.15	-.71918294	.00025691	4.13352945	.06896634
11	WARM TEST	295.15	-1.00717918	.00033540	----------	----------
12	COLD TEST	79.15	-.71919331	.00023739	4.12820421	.11596358
13	WARM TEST	295.15	-1.00720852	.00028656	----------	----------
14	COLD TEST	79.15	-.72079403	.00027409	4.15225627	.06067554
15	WARM TEST	295.15	-1.00757064	.00027188	----------	----------
16	COLD TEST	79.15	-.72648765	.00025183	4.23598374	.09328883
17	WARM TEST	295.15	-1.00794775	.00024794	----------	----------
18	COLD TEST	79.15	-.72250474	.00026766	4.17032037	.12491184
19	WARM TEST	295.15	-1.00745625	.00031105	----------	----------
20	COLD TEST	79.15	-.72433386	.00021670	4.20387985	.06873077

CH. 11 ,69.4 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.15434631315

NOISE POWER STABILITY (K) = .0731439954915

NOISE POWER STABILITY DELTA (K) = .100474104473

NPS_MAX (K) = .124911838357 NPS_MIN (K) = .0244377338835

INTEGRATION TIME = .165

S/O 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 12 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [signature]
Signature

Baseplate Temperature (T_B) 27.9 °C PLO No. 2

Compo-nent	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	12	Posi-tive		22.0	-1.001	.000430	-194.0	-.7191	.000379
				22.0	-1.001	.000407	-194.0	-.7166	.000350
				22.0	-1.001	.000421	-194.0	-.7212	.000296
				22.0	-1.001	.000426	-194.0	-.7199	.000313
		+15.12	686.61	22.0	-1.001	.000453	-194.0	-.7194	.000298
		Nega-tive		22.0	-1.002	.000462	-194.0	-.7202	.000310
		-15.14	-67.33	22.0	-1.002	.000461	-194.0	-.7179	.000316
				22.0	-1.002	.000421	194.0	-.7187	.000348
				22.0	-1.002	.000394	-194.0	-.7189	.000307
				22.0	-1.002	.000460	-194.0	-.7166	.000253
Mixer/ Amps	All	9.93	249.1						
IF Amps	All	7.94	266.7						

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: [signature]

Quality Assurance: TA 200

Date: 6/1/99

TEST DATA SHEET 10 (Sheet 27 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [signature]
Signature

Baseplate Temperature (T_B) 28.0 °C PLO No. 2

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
12		4.20				.08			
		4.16				.13			
		4.23				.11			
		4.21				.09			
		4.19				.07			
		4.20				.10			
		4.17				.10			
		4.18				.11			
		4.18				.15			
		4.15				.09			
	4.7		4.19	P	0.18		.10	.03	P

Pass = P, Fail = F

SO# 622 627

Part No.: 135629-2

Serial No.: F06

Test Engineer: [signature]

Quality Assurance: [stamp]

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-1 F06 ATP, CH 12 NF & NPS PLO# 2, TB =27, 5/29/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.00095853	.00042977	----------	---------
2	COLD TEST	79.15	-.71914436	.00037937	4.19583876	.08103122
3	WARM TEST	295.15	-1.00085886	.00040686	----------	---------
4	COLD TEST	79.15	-.71664426	.00035022	4.15831769	.13230478
5	WARM TEST	295.15	-1.00105044	.00042106	----------	---------
6	COLD TEST	79.15	-.72118636	.00029610	4.22659987	.10531809
7	WARM TEST	295.15	-1.00098486	.00042559	----------	---------
8	COLD TEST	79.15	-.71993148	.00031350	4.20777312	.09336499
9	WARM TEST	295.15	-1.00144121	.00045289	----------	---------
10	COLD TEST	79.15	-.71942270	.00029803	4.19477752	.07283845
11	WARM TEST	295.15	-1.00167305	.00046229	----------	---------
12	COLD TEST	79.15	-.72020807	.00031001	4.20437958	.10167712
13	WARM TEST	295.15	-1.00161975	.00046070	----------	---------
14	COLD TEST	79.15	-.71793206	.00031580	4.16975450	.09663105
15	WARM TEST	295.15	-1.00182713	.00042082	----------	---------
16	COLD TEST	79.15	-.71867053	.00034822	4.17885293	.10551018
17	WARM TEST	295.15	-1.00186088	.00039443	----------	---------
18	COLD TEST	79.15	-.71899028	.00030674	4.18341868	.15396941
19	WARM TEST	295.15	-1.00185666	.00045985	----------	---------
20	COLD TEST	79.15	-.71659231	.00025286	4.14655433	.09343839

CH. 12 .31 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.18668740605

NOISE POWER STABILITY (K) = .103608368394

NOISE POWER STABILITY DELTA (K) = .0811309618299

NPS_MAX (K) = .153969408805 NPS_MIN (K) = .0728384469746

INTEGRATION TIME = .165

S/O 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 13 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [illegible] Baseplate Temperature (T_B) 27.9 °C PLO No. 2
Signature

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	13	Positive		22.0	-1.042	.000629	-194.0	-.7452	.000447
				22.0	-1.041	.000640	-194.0	-.7487	.000458
				22.0	-1.041	.000668	-194.0	-.7435	.000467
				22.0	-1.041	.000703	-194.0	-.7421	.000455
		+15.12	486.62	22.0	-1.041	.000711	-194.0	-.7428	.000469
		Negative		22.0	-1.041	.000641	-194.0	-.7434	.000481
		-15.13	-67.33	22.0	-1.041	.000732	-194.0	-.74156 [illegible]	.000477
				22.0	-1.041	.000585	-194.0	-.7439	.000496
				22.0	-1.041	.000631	-194.0	-.7458	.000442
				22.0	-1.041	.000711	-194.0	-.7449	.000471
Mixer/ Amps	All	9.94	249.3						
IF Amps	All	7.93	266.7						

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: [illegible]
Quality Assurance: 24 200
Date: 6/1/98

TEST DATA SHEET 10 (Sheet 28 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [signature] Baseplate Temperature (T_B) 28.0 °C PLO No. 2
Signature

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
13		4.15				.10			
		4.21				.06			
		4.13				.13			
		4.11				.20			
		4.12				.22			
		4.13				.05			
		4.11				.25			
		4.14				.20			
		4.17				.10			
		4.16				.22			
	4.7		4.14	P	0.24		.15	.20	P

Pass = P, Fail = F

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: [signature]

Quality Assurance: TA 800

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-1 F06 ATP, CH 13 NF & NPS, PLO #2, 5/29/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-1.04192244	.00062965	----------	----------
2	COLD TEST	79.15	-.74515540	.00044745	4.14516133	.10284345
3	WARM TEST	295.15	-1.04080258	.00064023	----------	----------
4	COLD TEST	79.15	-.74867008	.00048525	4.20928106	.05545794
5	WARM TEST	295.15	-1.04083112	.00066776	----------	----------
6	COLD TEST	79.15	-.74348217	.00046699	4.13201323	.12656843
7	WARM TEST	295.15	-1.04060132	.00070347	----------	----------
8	COLD TEST	79.15	-.74209645	.00045479	4.11408167	.20403604
9	WARM TEST	295.15	-1.04089414	.00071125	----------	----------
10	COLD TEST	79.15	-.74276449	.00046916	4.12081215	.21769397
11	WARM TEST	295.15	-1.04076879	.00064065	----------	----------
12	COLD TEST	79.15	-.74335573	.00048091	4.13080866	.05168550
13	WARM TEST	295.15	-1.04063924	.00073241	----------	----------
14	COLD TEST	79.15	-.74155776	.00047660	4.10580228	.25125864
15	WARM TEST	295.15	-1.04054442	.00058496	----------	----------
16	COLD TEST	79.15	-.74386986	.00049624	4.14073711	.19690677
17	WARM TEST	295.15	-1.04066181	.00063076	----------	----------
18	COLD TEST	79.15	-.74576923	.00044219	4.16757351	.09704336
19	WARM TEST	295.15	-1.04055003	.00071089	----------	----------
20	COLD TEST	79.15	-.74499462	.00047134	4.15728678	.21930815

CH. 13 ,15.8 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.14245025863

NOISE POWER STABILITY (K) = .152280223805

NOISE POWER STABILITY DELTA (K) = .199573141472

NPS_MAX (K) = .251258638045 NPS_MIN (K) = .0516854965732

INTEGRATION TIME = .165

S/O 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 14 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [signature] Baseplate Temperature (T_B) 28.0 °C PLO No. 2
Signature

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	14	Positive		22.0	-.9828	.000986	-194.0	-.7023	.000781
				22.0	-.9812	.000957	-194.0	-.7022	.000767
				22.0	-.9811	.000903	-194.0	-.7025	.000723
				22.0	-.9815	.000976	-194.0	-.7036	.000722
		+15.12	686.62	22.0	-.9817	.000949	-194.0	-.7064	.000665
		Negative		22.0	-.9817	.000970	-194.0	-.7063	.000705
		-15.12	-67.32	22.0	-.9819	.000955	-194.0	-.7049	.000663
				22.0	-.9824	.000962	-194.0	-.7062	.000643
				22.0	-.9822	.000895	-194.0	-.7044	.000667
				22.0	-.9825	.000988	-194.0	-.7070	.000619
Mixer/Amps	All	9.94	249.3						
IF Amps	All	7.95	266.9						

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: [signature]
Quality Assurance: IA 200
Date: 6/1/99

TEST DATA SHEET 10 (Sheet 29 of 30)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: [illegible]
Signature

Baseplate Temperature (T_B) 28.0 °C PLO No. 2

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
14		4.14				.04			
		4.15				.18			
		4.16				.31			
		4.17				.11			
		4.21				.21			
		4.21				.14			
		4.19				.19			
		4.20				.17			
		4.18				.32			
		4.21				.04			
	4.7		4.18	P	0.36		.17	.28	P

Pass = P, Fail = F

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: [illegible]

Quality Assurance: TA 200

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-1 F06 ATP, CH 14 NF & NPS, PLO #2, TB = 27, 5/29/99

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-.98276260	.00098612	----------	----------
2	COLD TEST	79.15	-.70232284	.00078053	4.13699887	.04321253
3	WARM TEST	295.15	-.98119250	.00095714	----------	----------
4	COLD TEST	79.15	-.70215445	.00076697	4.15191779	.18375127
5	WARM TEST	295.15	-.98111568	.00090301	----------	----------
6	COLD TEST	79.15	-.70254439	.00072330	4.15889575	.30711190
7	WARM TEST	295.15	-.98152291	.00097645	----------	----------
8	COLD TEST	79.15	-.70363225	.00072223	4.17140654	.10897039
9	WARM TEST	295.15	-.98172910	.00094964	----------	----------
10	COLD TEST	79.15	-.70642000	.00066512	4.21313301	.21008991
11	WARM TEST	295.15	-.98167689	.00097019	----------	----------
12	COLD TEST	79.15	-.70625048	.00070475	4.21103790	.14061168
13	WARM TEST	295.15	-.98193312	.00095519	----------	----------
14	COLD TEST	79.15	-.70494658	.00066265	4.18748253	.19346087
15	WARM TEST	295.15	-.98237425	.00096195	----------	----------
16	COLD TEST	79.15	-.70624040	.00064330	4.20292689	.17396432
17	WARM TEST	295.15	-.98219990	.00089598	----------	----------
18	COLD TEST	79.15	-.70436461	.00066728	4.17529182	.32213446
19	WARM TEST	295.15	-.98251578	.00098886	----------	----------
20	COLD TEST	79.15	-.70704237	.00061938	4.21402656	.04119471

CH. 14 .6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.18239147081

NOISE POWER STABILITY (K) = .172450204548

NOISE POWER STABILITY DELTA (K) = .280939750117

NPS_MAX (K) = .322134458821 NPS_MIN (K) = .0411947087039

INTEGRATION TIME = .165

S/O 622627
P/N 1356429-2
TDS 10

TEST DATA SHEET 10 (Sheet 15 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Gary Lamb (Signature)   Baseplate Temperature (T_B) 28 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	15	14.88	158	22.0	-1.0524	.000684	194	-.7760	.000480
				22.0	-1.0502	.000656	194	-.7753	.000518
				22.0	-1.0496	.000730	194	-.7742	.000490
				22.0	-1.0492	.000646	194	-.7718	.000488
				22.0	-1.0495	.000622	194	-.7719	.000495
				22.0	-1.0493	.000674	194	-.7728	.000423
				22.0	-1.0498	.000695	194	-.7742	.000596
				22.0	-1.0499	.000672	194	-.7744	.000460
				22.0	-1.0501	.000672	194	-.7725	.000478
				22.0	-1.0504	.000714	194	-.7727	.000490
Mixer/ Amps	All	9.93	249						
IF Amps	All	7.95	267						

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: Gary Lamb
Quality Assurance: TA 200
Date: 6/1/99

TEST DATA SHEET 10 (Sheet 30 of 30)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Gary Lawler Baseplate Temperature (T_B) 28 °C
Signature

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
15		6.76				.041			
		6.70				.050			
		6.69				.067			
		6.72				.042			
		6.72				.092			
		6.69				.025			
		6.70				.061			
		6.76				.030			
		6.75				.047			
		6.77				.115			
	9.05		6.73	P	0.15		.057	.091	P

Pass = P, Fail = F

SO # 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: Gary Lawler

Quality Assurance: TA 200

Date: 6/1/99

AMSU-A TEST **FOR REFERENCE ONLY**

A1-1 F06 ATP. CH15 NF & NPS: 5/26/99 TB = 27

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.15	-.89820738	.00007652	----------	----------
2	COLD TEST	79.15	-.75785198	.00007964	6.76582155	.04062746
3	WARM TEST	295.15	-.89788916	.00007888	----------	----------
4	COLD TEST	79.15	-.75569258	.00006581	6.70746390	.04962423
5	WARM TEST	295.15	-.89776834	.00008432	----------	----------
6	COLD TEST	79.15	-.75534227	.00007688	6.69984726	.06709223
7	WARM TEST	295.15	-.89762732	.00006631	----------	----------
8	COLD TEST	79.15	-.75587868	.00011350	6.71994657	.04183757
9	WARM TEST	295.15	-.89865042	.00009402	----------	----------
10	COLD TEST	79.15	-.75690850	.00008534	6.72511906	.09241201
11	WARM TEST	295.15	-.89903232	.00006995	----------	----------
12	COLD TEST	79.15	-.75601337	.00008600	6.68787104	.02498478
13	WARM TEST	295.15	-.89939185	.00008237	----------	----------
14	COLD TEST	79.15	-.75682810	.00008534	6.70351148	.06085386
15	WARM TEST	295.15	-.89930205	.00007434	----------	----------
16	COLD TEST	79.15	-.75844619	.00010756	6.75561534	.02891315
17	WARM TEST	295.15	-.89962136	.00007828	----------	----------
18	COLD TEST	79.15	-.75850247	.00010364	6.74903035	.04725644
19	WARM TEST	295.15	-.89972368	.00010396	----------	----------
20	COLD TEST	79.15	-.75936176	.00009948	6.77297199	.11548879

CH. 15 .948 MHz MHz

NOISE FIGURE AVERAGE (dB) = 6.72881372687

NOISE POWER STABILITY (K) = .0569090496306

NOISE POWER STABILITY DELTA (K) = .0905040091894

NPS_MAX (K) = .115488786987 NPS_MIN (K) = .0249847777978

INTEGRATION TIME = .165

S/O 622627

P/N 1356429-2

S/N F06

TEST DATA SHEET 16

Temperature Sensor and Thermistor Test Data (Paragraph 3.6.1) (A1-1)

Test Setup Verified: RV Platt
Signature

Baseplate Temperature (T_B) 23 °C

Reference Designation	Specification	Measured Value	Pass/Fail
RT 40	2200 ± 100 Ω	2171 Ω	P
RT 45	2200 ± 100 Ω	2171 Ω	P
RT 11	2200 ± 100 Ω	2167 Ω	P
RT 13	2200 ± 100 Ω	2176 Ω	P
RT 15	2200 ± 100 Ω	2171 Ω	P
RT 14	2200 ± 100 Ω	2171 Ω	P
RT 20	2200 ± 100 Ω	2170 Ω	P
RT 21	2200 ± 100 Ω	2170 Ω	P
RT 23	2200 ± 100 Ω	2175 Ω	P
RT 24	2200 ± 100 Ω	2170 Ω	P
RT 25	2200 ± 100 Ω	2171 Ω	P
RT 26	2200 ± 100 Ω	2175 Ω	P
RT 27	2200 ± 100 Ω	2173 Ω	P
RT 28	2200 ± 100 Ω	2176 Ω	P
RT 29	2200 ± 100 Ω	2175 Ω	P
RT 30	2200 ± 100 Ω	2176 Ω	P
RT 31	2200 ± 100 Ω	2176 Ω	P
RT 34	2200 ± 100 Ω	2170 Ω	P
TB 56	3000 ± 100 Ω	3002 Ω	P
TB 57	3000 ± 100 Ω	3002 Ω	P
TB 53	4.1 – 4.6 V	4.35 V	P

Pass = P, Fail = F

SO # 622627

Part No.: 135629-2

Serial No.: F06

Test Engineer: [signature]

Quality Assurance: TA 200

Date: 5/28/99

TEST DATA SHEET 19

Survival Heater and Thermal Switch Test Data (Paragraph 3.6.2) (A1-1)

Test Setup Verified: Robert M Platt
Signature

Baseplate Temperature (T_B) 23 °C

	Open Switch		Closed Switch		
Reference Designation	>10 MΩ	Pass/Fail	Specification	Measured Value	Pass/Fail
HR1/TS1	>50 MΩ	P	25 - 35 Ω	30.5 Ω	P
	>50 MΩ	P		30.6 Ω	P
HR2/TS2	>50 MΩ	P		30.7 Ω	P
	>50 MΩ	P		30.7 Ω	P

Pass = P, Fail = F

SO# 622627

Part No.: 1356429-2

Serial No.: F06

Test Engineer: [signature]

Quality Assurance: QA 200

Date: 5/28/99

TEST DATA SHEET 22 (Sheet 1 of 3)
Bias Voltage Verification Test Data (Paragraph 3.6.3) (A1-1)

Test Setup Verified: [signature]
Signature

Baseplate Temperature (T_B) 24 °C

Reference Designation	Specification	Measured Value (V)	Pass/Fail
Mixer/IF AMP Ch 6, 7, 15, 9-14	+10 ±0.1	9.91	P
DRO Ch 7	+10 ±0.1	9.91	P
DRO Ch 15	+15 ±0.15	14.86	P
PLO +15	+15 ±0.15	15.07	P
PLO -15	-15 ±0.15	-15.15	P
IF AMP Ch 9-14	+8 ±0.08	7.925	P
DRO Ch 6	+10 ±0.1	9.94	P

SO# 622627
Part No.: 1356429-2
Serial No.: F06

Test Engineer: [signature]
Quality Assurance: QA 200
Date: 5/28/99

7.0 ASSEMBLY INSTALLATION AND REPLACEMENT LOG

The assembly installation and replacement for this receiver subsystem are logged in the following pages.

F06

GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)		PAGE	OF
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-2)	PART NUMBER 1356409-1	1	6

PLANNED BY	DATE	REVISION	NEXT ASSEMBLY	OPER
B. MULLIGAN	10/21/98	03	1331720-2/1356008-1	0004

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

INITIAL INSTALLATION							REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	IN
17	1356680-1	B	ISOLATOR, CH 3	012	2-17-99 95 T		B	006	MF 44	
18	1356680-2	B	ISOLATOR, CH 4	010	2-17-99 95 T		B			
19	1356680-3	B	ISOLATOR, CH 5	09	2-18-99 95 T		B	011	MF 44	
20	1356680-6	B	ISOLATOR, CH 8	010	2-18-99 95 T		B	011	MF 44	
22	1331507-1	G	MULTIPLEXER	08	2-17-99 95 T					
23	1331509-1	G	WAVEGUIDE ATTENUATOR	103	1-8-99 95 T		G	101	2-17-99 95 T	
24	1331509-2	G	WAVEGUIDE ATTENUATOR	104	1-6-99 95 T		G	102	2-23-99 95 T	
25	1331509-3	E	WAVEGUIDE ATTENUATOR	104	1-6-99					
26	1331509-6		WAVEGUIDE ATTENUATOR	101	--	--		103	7/25/0	
28	1336610-3	F	STABLE OSCILLATOR	85095	1-8-99 95 T		F	85097	2-9-99 95 T	
29	1336610-4	F	STABLE OSCILLATOR	85042	1-6-99 95 T					
30	1336610-5	F	STABLE OSCILLATOR	~~85033~~	1-6-99		F	85036 ~~85035~~		

NOTES:

1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
3. IF A COMPONENT(S) OR PART(S HAVE BEEN REMOVED AND REPLACED MORE THAN ONCE RECORD THE REPLACEMENT P NUMBER AT THE END OF THE ASSEMBLY LOG .

F06

GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)		PAGE	OF
	PART DESCRIPTION: RECEIVER ASSEMBLY (A1-2)	PART NUMBER: 1356409-1	2	6
PLANNED BY: B. MULLIGAN	DATE: 10/21/98	REVISION: 03	NEXT ASSEMBLY: 1331720-2/1356008-1	OPER: 0004

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

INITIAL INSTALLATION							REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSP
31	1336610-8	F	STABLE OSCILLATOR	85074				85079	7/21/00	
37	1331562-13	G	MIXER/AMP CH 3	7A63	MFG 204 1-8/99		G	7A23	ME 44	
38	1331562-14	G	MIXER/AMP CH 4	7A64	MFG 204 1-8/99			~~7A68~~	ul 3/11/99	
39	1331562-15	G	MIXER/AMP CH 5	7A65	MFG 204 1-8/99					
40	1331562-18	G	MIXER/AMP CH 8	~~7A~~58	3-3-99		G	7A68	ME 44	
86	1331559-2	E	FILTER, IF BAND PASS	~~02~~ 022	3-9-99 95					
87	1331559-3	E	FILTER, IF BAND PASS	011	3-9-99 95					
88	1331559-4	E	FILTER, IF BAND PASS	014	3-9-99 95					
89	1331559-5	E	FILTER, IF BAND PASS	007	3-9-99 95					
9 / 9	1356406-1	D	THERMISTER COMPONENT ASSY	F31 / F58	3-24-99 95					
98	1337651-1		THERMISTER COMPONENT ASSY	CN 209	3-24-99 95					

NOTES:

1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
3. IF A COMPONENT(S) OR PART(S) HAVE BEEN REMOVED AND REPLACED MORE THAN ONCE, RECORD THE REPLACEMENT PART NUMBER AT THE END OF THE ASSEMBLY LOG.

GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)			PAGE	OF
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-2)		PART NUMBER 1356409-1	3	6
PLANNED BY B. MULLIGAN	DATE 10/21/98	REVISION 03	NEXT ASSEMBLY 1331720-2/1356008-1	OPER 0004	

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

INITIAL INSTALLATION							REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSP

NOTES:

1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
3. IF A COMPONENT(S) OR PART(S) HAVE BEEN REMOVED AND REPLACED MORE THAN ONCE, RECORD THE REPLACEMENT PART NUMBER AT THE END OF THE ASSEMBLY LOG.

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

INITIAL INSTALLATION							REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSP

NOTES:

1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
3. IF A COMPONENT(S) OR PART(S) HAVE BEEN REMOVED AND REPLACED MORE THAN ONCE, RECORD THE REPLACEMENT PART NUMBER AT THE END OF THE ASSEMBLY LOG.

GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)		PAGE	OF
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-2)	PART NUMBER 1356409-1	5	6

PLANNED BY	DATE	REVISION	NEXT ASSEMBLY	OPER
B. MULLIGAN	10/21/98	03	1331720-2/1356008-1	0004

ASSEMBLY INSTALLATION AND REPLACEMENT LOG
TEMPERATURE SENSORS & THERMISTORS

SENSOR	INITIAL INSTALLATION			REPLACEMENT		
	S/N	MFG	INSP	S/N	MFG	INSP
RT12	1360					
RT17						
RT18						
RT19						
RT22						
RT33						
RT41						
RT42	1351					
RT43						
RT44						

SENSOR	INITIAL INSTALLATION			REPLACEMENT		
	S/N	MFG	INSP	S/N	MFG	INS
TB54	CN209	3-24-99 35				
TB58	F58	3-24-99 35				
TB59	F31	3-24-99 35				

NOTES:

1. THIS LOG SHALL BE COMPLETED AT THE TIME THAT THE COMPONENT(S) OR PART(S) ARE BEING INSTALLED INTO THE ASSEMBLY. EACH LINE SHALL BE ENTERED AND STAMPED BY THE OPERATOR THAT INSTALLED THE COMPONENT(S) OR PART(S)
2. IF A COMPONENT(S) OR PART(S) ARE REMOVED AND REPLACED, RECORD THE REPLACEMENT PART ON IT'S RESPECTIVE LINE.
3. IF A COMPONENT(S) OR PART(S) HA BEEN REMOVED AND REPLACED MORE THAN ONCE, RECORD THE REPLACEMENT PART NUMBER AT THE END OF THE ASSEMBLY LOG.

GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)		PAGE	OF
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-2)	PART NUMBER 1356409-1	6	6

PLANNED BY	DATE	REVISION	NEXT ASSEMBLY	OPER
B. MULLIGAN	10/21/98	03	1331720-2/1356008-1	0004

ASSEMBLY INSTALLATION AND REPLACEMENT LOG
IF ATTENUATORS

		INITIAL INSTALLATION					REPLACEMENT				
ATTEN-UATOR	ON MODULE	DASH NO.	S/N	AT NO.	MFG.	INSP	DASH NO.	S/N	AT NO.	MFG	INSP
A18	A5										
A19	A9										
A20	A13										
A21	A17										

NOTES:

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F06

GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)			PAGE 1	OF 6
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-1)		PART NUMBER 1356429-2		
PLANNED BY B. MULLIGAN	DATE 10/14/98	REVISION 02	NEXT ASSEMBLY 1331720-2	OPER 0004	

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

INITIAL INSTALLATION							REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSP
9	1356680-4	B	ISOLATOR, CHAN 6	10	12-22-98					
10	1356680-5	B	ISOLATOR, CHAN 7	08 ~~106~~	1-12-99			07	~~07~~ 5/10/00	
11	1356680-7	B	ISOLATOR, CHAN 9-14	09 ~~06~~	12-2?-98					
12	1356680-8	B	ISOLATOR, CHAN 15	07	12-16-98					
14	1331509-4	~~B~~ E	WAVEGUIDE ATTENUATOR	~~107~~	~~12-14-98~~ 1-7-99					
15	1331509-5	G	WAVEGUIDE ATTENUATOR	103 ~~106~~	1-8-99			103	5/10/00	
16	1331509-7	J	WAVEGUIDE ATTENUATOR	105	4/26/99					
17	1331509-~~8~~ -10	J	WAVEGUIDE ATTENUATOR	102	2-24-99					
18	1331509-9	~~B~~ E	WAVEGUIDE ATTENUATOR	106	1-8-99		E	107	5/24/99	
19	1331510-1	E	WAVEGUIDE A-1 (CHAN 9)	105	3-15-99					
20	1336610-6	F	STABLE OSCILLATOR (A39)	85026	1-7-99					
21	1336610-7	F	STABLE OSCILLATOR (A34)	85017 ~~85023~~	1-7-99			85023	5/10/00	

NOTES:

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GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)		PAGE	OF
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-1)	PART NUMBER 1356429-2	2	6

PLANNED BY	DATE	REVISION	NEXT ASSEMBLY	OPER
B. MULLIGAN	10/14/98	02	1331720-2	0004

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

INITIAL INSTALLATION							REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSP
22	1336610-10	E	STABLE OSCILLATOR (A29)	FM3	1-8-99 95 T		E	FM2	5/17/99	
23	1356669-1	B	POWER DIVIDER, 3 WAY	P234 07	1-20-99 95 T					
25	1331546-1	G	MULTIPLEXER	07	12-15-98 95 T					
26	1348360-4	P	PLO ASSEMBLY (A65)	F11	3-16-99 95 T		P	F14	4/26/99	
26	1348360~~-4~~ 3 4/26/99	P	PLO ASSEMBLY (A66)	F01	4/26/99 MFG 110					
27	1331554-1	F	HYBRID TEE (A63)	06	3-16-99 95 T					
31	1331562-16	G	MIXER/AMP CHAN 6	7A66	1-8-99 95 T					
32	1331562-17	G	MIXER/AMP CHAN 7	7A57	1-8-99 95 T			7A67	5/1/00	
* 33	1331562-19	G	MIXER/AMP CHAN 9-14	7A59	3-12-99 95 T					
34	1331562-20	G	MIXER/AMP CHAN 15 (A25)	7A70	1-7-99 95 T		G	7A69	5/17/99	
35	1331576-1	C	SAW FILTER	B04	3-16-99 95 T					
36	1331576-2	C	SAW FILTER	B06	3-16-99 95 T					

NOTES:

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GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)				PAGE	OF
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-1)			PART NUMBER 1356429-2	3	6
PLANNED BY B. MULLIGAN	DATE 10/14/98		REVISION 02	NEXT ASSEMBLY 1331720-2	OPER 0004	

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

INITIAL INSTALLATION							REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSP
37	1331576-3	C	SAW FILTER	B07	3-16-99 95 T					
38	1331576-4	C	SAW FILTER	B08	3-16-99 95 T					
39	1356670-1	C	POWER DIVIDER 4-WAY	P235 06	3-1-99 95 T					
40	1331579-7	F	AMPLIFIER, IF	106	3-1-99 95 T					
41	1331579-8	G	AMPLIFIER, IF	110	3-1-99					
42	1331579-9	G	AMPLIFIER, IF	109	3-1-99					
43	1331579-10	G	AMPLIFIER, IF	110	3-16-99 95 T					
44	1331579-11	G	AMPLIFIER, IF	109	3-16-99 95 T					
45	1331579-12	G	AMPLIFIER, IF	110	3-16-99 95 T					
46	1331579-13	G	AMPLIFIER, IF	109	3-16-99 95 T					
54 54	1331559-2	E	FILTER, I.F. BAND PASS	019 ~~bottom~~ 011	12-21-98 95 T					
55	1331559-1	E	FILTER, I.F. BAND PASS	006	1-5-99 95 T					

NOTES:

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GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)		PAGE	OF
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-1)	PART NUMBER 1356429-2	4	6

PLANNED BY	DATE	REVISION	NEXT ASSEMBLY	OPER
B. MULLIGAN	10/14/98	02	1331720-2	0004

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

INITIAL INSTALLATION							REPLACEMENT			
ITEM NO.	PART NUMBER	REV	DESCRIPTION	S/N	MFG	INSP	REV	S/N	MFG	INSP
56	1331559-7	E	FILTER, I.F. BAND PASS	P233 009	3-15-99 95					
57	1331559-4	E	FILTER, I.F. BAND PASS	P230 015	3-15-99 95					
160	1357410-1		RELAY							
27 ~~58~~	1331554-1	F	HYBRID TEE	02	2-24-99 95					
151	1337451-1	D	THERMISTOR COMP. ASSY	C/N 212	3-31-99					
8	1356404-1	D	THERMISTOR COMP. ASSY	F51	3-31-99					
8	1356404-1	D	"	F10						

NOTES:

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GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)		PAGE	OF
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-1)	PART NUMBER 1356429-2	5	6

PLANNED BY	DATE	REVISION	NEXT ASSEMBLY	OPER
B. MULLIGAN	10/14/98	02	1331720-2	0004

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

TEMPERATURE SENSORS & THERMISTORS

SENSOR	INITIAL INSTALLATION			REPLACEMENT		
	S/N	MFG	INSP	S/N	MFG	INSP
RT11	1116					
RT13	1273					
RT14	1346					
RT15	1208					
RT20	1347					
RT21	1334					
RT23	1362					
RT24	1276					
RT25	1342					
RT26	1336					
RT27	1340					

SENSOR	INITIAL INSTALLATION			REPLACEMENT		
	S/N	MFG	INSP	S/N	MFG	INS
RT28	1338					
RT29	1352					
RT30	1343					
RT31	1337					
RT34	1272					
RT40	1341					
RT45	1345					
TB53	212	3-31-99				
TB56	F10	3-31-99				
TB57	F51	3-31-99				

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GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)			PAGE	OF
	PART DESCRIPTION RECEIVER ASSEMBLY (A1-1)		PART NUMBER 1356429-2	6	6
PLANNED BY B. MULLIGAN	DATE 10/14/98	REVISION 02	NEXT ASSEMBLY 1331720-2	OPER 0004	

ASSEMBLY INSTALLATION AND REPLACEMENT LOG

IF ATTENUATORS

		INITIAL INSTALLATION					REPLACEMENT				
ATTEN-UATOR	ON MODULE	DASH NO.	S/N	AT NO.	MFG	INSP	DASH NO.	S/N	AT NO.	MFG	INSP
A28	A26										
A33	A32										
A38	A37										
A47	A46										
A50	A49										
A53	A52										
A56	A55										
A59	A58										
A62	A61										

NOTES:

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ADDENDUM/AMENDMENT A

TO

REPORT 11491

ADDENDUM/AMENDMENT
TO

PERFORMANCE VERIFICATION TEST REPORT
METSAT (S/N: 109) AMSU-A1 RECEIVER ASSEMBLIES
FOR
INTEGRATED ADVANCED MICROWAVE SOUNDING UNIT-A
(AMSU-A)

CONTRACT NO. NAS5-32314
CDRL PAR 3.3.2.1

JANUARY 2000

SUBMITTED TO

NATIONAL AERONAUTICS AND SPACE ADMINISTERATION
GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND 20771

SUBMITTED BY

AEROJET ELECTRONIC SYSTEMS PLANT
1100 WST HOLLYVALE STREET
AZUSA, CALIFORNIA 91702

1.0 Summary

After the survival/safety heater check, during the Thermal Cycle No.1 at cold temperature (-12° C) of METSAT/AMSU-A1 system (Assembly No. 1331720-3, S/N: 109), it was noted that the radiometric counts on Channel 8 were ~8,000 counts (should be ~16,000). During the transition to +48° C the counts returned to normal level at ~ +11°C. After receiving permission from NASA (S. Krimchansky), Aerojet again cooled the instrument from ambient to ~ -12°C. After the power was turned on the Channel 8 anomaly repeated (~8,000 counts). The instrument was returned to ambient and removed from the temperature chamber. The Channel 8 RF section (isolator (P/N: 1356680-6, S/N 011), mixer/IF amplifier (P/N: 1331562-18, S/N: 7A68), DRO (P/N: 1336610-8, S/N: 85074), and waveguide attenuator (P/N: 1331509-6, S/N: 101), was replaced by the spare RF components (isolator S/N: 008), mixer/IF amplifier (S/N: 7A38), DRO (S/N: 85079), and wave-guide attenuator (S/N: 103). An LPT was performed and the instrument was returned to Thermal Cycle testing with the new (spare) Channel 8 RF section. The test data for DRO (S/N: 85079) and mixer/IF amplifier (S/N: 7A38), are included in the addendum/amendment of this Test Report (Report No. 11491). The tables for the center frequency and frequency stability of the LO, and the gain-temperature sensitivity of the mixer/IF amplifier are modified to reflect the replacement components for that channel. The test data for the new components are recorded in **bold.**

2.0 Summary

During thermal vacuum test at temperature combination #7 cycle/subcycle 6, the NEΔT for Channel 7 was .301. (Should be $\leq$ .250). Distribution plot also indicated high degree of noise. After receiving permission from NASA, re-ran test at same plateau, and performed engineering test runs as instrument approached ambient. Test results were as stated above. The instrument was removed from chamber and removed from calibration fixture.

The Channel 7 RF section (Waveguide Attenuator P/N 1331509-5 S/N 102, mixer/amp P/N 1331562-17, S/N 7A57, DRO Assembly P/N 1336610-7 S/N 85017, isolator P/N 1356680-5 S/N 008) were removed. Replaced by DRO Assy S/N 85023, mixer/amp S/N 7A67, Waveguide Attenuator S/N 103, isolator S/N 7. Bandpass, IF power output, full print and NEΔT tests were performed. Instrument was vibrated and returned to thermal vacuum testing. The test data for DRO S/N 85023, and mixer/amp S/N 7A67 are included in the addendum/amendment of this test report (#11491). The tables for center frequency and frequency stability of the lo, and gain-temperature sensitivity of the mixer/IF amplifier are modified to reflect replacement components for that channel. The test data for the new components are recorded in bold.

CENTER FREQUENCY AND FREQUENCY STABILITY

FOR

LOCAL OSCILLATORS (LOs)
(DROs, PLOs, & GDO)

CENTER FREQUENCY OF LOs

Channel No.	3	4	5	6	7	8	9-14 *	15
Specification (GHz) Setting Accuracy (+/-GHz)	50.3 0.002	52.8 0.001	53.596 0.001	54.4 0.001	54.94 0.001	55.5 0.002	57.290344 0.000086	89.0 0.03
Measured (GHz)	50.30054	52.80020	53.59594	54.40007	**54.94028**	**55.50030**	57.290342 57.290328	89.008

* Measured for PLO No. 1 and No. 2.

FREQUENCY STABILITY OF LOs

Channel No.	3	4	5	6	7	8	9-14 *	15
Short-Term Specification (+/-MHz)	8	3	3	3	3	8	0.086	80
Setting Accuracy (+/-MHz)	2	1	1	1	1	2		30
W/ Temp. & Voltage (+/-MHz)	6	2	2	2	2	6		50
Measured (MHz) Total	+3.46, -3.14	+0.21, -0.84	+0.16, . -0.45	+1.47, -1.85	**+.25 -0.018**	**+0.33, -0.48**	+0.007, -0.018 +0.016, -0.026	+15., -11.
Long-Term Specification (+/-MHz)	2	2	2	2	2	2	0.114	50
By Design or Analysis ** (+/-MHz)	0.1	0.1	0.1	0.1	0.1	0.1	0.115	76

* Measured for PLO No. 1 and No. 2.

** Based on accelerated life-test data for DROs.

Note: Additional +/-0.1MHz frequency stability reserved for safety margin for channels 11-14.

Channel 8 LO

DRO (P/N: 1336610-8, S/N: 85079)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AK/A
SERIAL NUMBER: 85079
QUAL TEST N/A
AESD 1336610- 8
ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	179 mA	Table IIIB
Input Power, P_{diss}	1.79 W DC	P_{diss} max
Frequency, f_{Tnom}	55.50030 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.3 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.30 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	177 mA	Table IIIB
equency, f_{meas}	55.50030 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	178 mA	Table IIIB
Frequency, f_{meas}	55.50030 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 VDC = Ø MHz
Δf_V at 10.5 VDC or at 10.5 VDC = Ø MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 VDC = Ø dB
ΔP_V at 10.5 VDC or at 10.5 VDC = Ø dB

Accept ✓ Reject ____

Test Performed by [illegible] Date 7-27-98
Litton QA LITTON Date JUL 3 0 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036AK/A
SERIAL NUMBER: 85079 QUAL TEST N/A
AESD 1336610- 8
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	10 °C	10° ± 1°C
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	179 mA	Table IIIB
Input Power, P_{diss}	1.79 W DC	Pdiss max
Frequency, $f_{10°C}$	55.50024 GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.3 dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	10 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	176 mA	Table IIIB
Frequency, f_{meas}	55.50022 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	10 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	178 mA	Table IIIB
Frequency, f_{meas}	55.50022 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = -0.02 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = -0.02 MHz
Δf_T at 10.0 VDC ($= f_{10°C} - f_{Tnom}$) = -0.06 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($= P_{10°C} - P_{Tnom}$) = ∅ dB

Accept ✓ Reject ______

Test Performed by VN Date 7-27-98
Litton Q.A. LITTON M 60 Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B3	

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AK/A
SERIAL NUMBER: 85079
QUAL TEST N/A
AESD 1336610- 8
ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	179	mA	Table IIIB
Input Power, P_{diss}	1.79	W DC	Pdiss max
Frequency, f_{Tmin}	55.50013	GHz	Table IIIB
RF Output Power, P_{Tmin}	12.3	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	177	mA	Table IIIB
Frequency, f_{meas}	55.50014	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	178	mA	Table IIIB
Frequency, f_{meas}	55.50013	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:
Δf_V at 9.5 VDC or at 9.5 VDC = 0.01 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = ∅ MHz
Δf_T at 10.0 VDC ($=f_{Tmin} - f_{Tnom}$) − 0.17 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{Tmin} - P_{Tnom}$) = ∅ dB

Accept ✓ Reject ____

Test Performed by VN Date 7-27-98
Litton Q.A. LITTON M 60 Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 40 OF 68
56348	A	1300823	B3	

LITTON / SOLID STATE DIVISION / 3251 OLCOTT ST / SANTA CLARA, CA 95054

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AK/A
SERIAL NUMBER: 85079 QUAL TEST N/A

AESD 1336610- 8
ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	30 °C	30° ± 1°C
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	180 mA	Table IIIB
Input Power, P_{diss}	1.80 W DC	Pdiss max
Frequency, $f_{30°C}$	55.50030 GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.3 dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	30 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	178 mA	Table IIIB
Frequency, f_{meas}	55.50031 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	30 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	179 mA	Table IIIB
Frequency, f_{meas}	55.50030 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:
Δf_V at 9.5 VDC or at 9.5 VDC = 0.01 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = ϕ MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$) = ϕ MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = ϕ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ϕ dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$) = ϕ dB

Accept ✓ Reject ____

Test Performed by VN Date 7-27-98
Litton Q.A. LITTON MCO Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A
SERIAL NUMBER: 85079
QUAL TEST N/A
AESD 1336610- 8
ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	181	mA	Table IIIB
Input Power, P_{diss}	1.81	W DC	Pdiss max
Frequency, f_{Tmax}	55.50008	GHz	Table IIIB
RF Output Power, P_{Tmax}	12.1	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	179	mA	Table IIIB
Frequency, f_{meas}	55.50006	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	180	mA	Table IIIB
Frequency, f_{meas}	55.50604	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at 9.5 VDC = -0.02 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = -0.04 MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$) = -0.22 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$) = -0.2 dB

Accept ✓ Reject ______

Test Performed by VN Date 7-27-98
Litton Q.A. LITTON QA Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.7
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A AESD 1336610- 8
SERIAL NUMBER: 85079 QUAL TEST N/A ACCEPT TEST ✓

Power Supply Immunity, Ref. Test Para. 5.2.4

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Initial Measurement			
Temperature	22	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	179	mA	Table IIIB
Input Power	1.79	W DC	Pdiss max
Frequency (f_{Tnom})	55.50021	GHz	Table IIIB
RF Output Power	12.3	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.21	MHz	

Performance After Short Circuit on Power Supply: Ref Test Para 5.2.4.2

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	179	mA	Table IIIB
Input Power	1.79	W DC	Pdiss max
Frequency	55.50018	GHz	Table IIIB
RF Output Power	12.3	dBm	12 to 17 dBm

Over Voltage: Ref Test Para 5.2.4.3

Overvoltage Input Voltage	28	VDC	+28V

Performance After Input Overvoltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	179	mA	Table IIIB
Input Power	1.79	W DC	Pdiss max
Frequency	55.50016	GHz	Table IIIB
RF Output Power	12.3	dBm	12 to 17 dBm

Reverse Polarity: Ref Test Para 5.2.4.4

Reverse Input Voltage	-10	VDC	-10.0 ± 0.2 VDC

Performance After Reverse Input Voltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	179	mA	Table IIIB
Input Power	1.79	W DC	Pdiss max
Frequency, f_{Tnom}	55.50016	GHz	Table IIIB
RF Output Power	12.3	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.16	MHz	

Accept ✓ Reject ______

Test Performed by VN Date 7-27-98
Litton Q.A. ______ Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 43 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.22A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AK/A — AESD 1336610- 8
SERIAL NUMBER: 85079 — QUAL TEST N/A — ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION			LIMITS
1. Initial Performance at Tnom ± 1°C			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{Tnom}	55.50030	GHz	Table IIIB
RF Output Power, P_{Tnom}	12.3	dBm	12 to 17 dBm
Input Voltage, V_B	10	VDC	10 ± 0.2 VDC
Input Current, I_B	179	mA	Table IIIB
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.30	MHz	
2. Performance at Tnom ± 1°C after +60°C soak.			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	55.50008	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm
Input Voltage	10	VDC	V_B ± .005 VDC
Input Current	180	mA	Table IIIB
3. Performance at Tnom ± 1°C after -30°C soak.			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	55.50031	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm
Input Voltage	10	VDC	V_B ± .005 VDC
Input Current	179	mA	Table IIIB

Calculate frequency variation, $\Delta f_H = f_{meas} - f_{Tnom}$:
Δf_H after 60°C soak = -0.22 MHz
Δf_H after -30°C soak = 0.01 MHz

Calculate RF output power variation, $\Delta P_H = P_{meas} - P_{Tnom}$:
ΔP_H = after 60°C soak = ϕ dB
ΔP_H = after -30°C soak = ϕ dB

Accept ✓ Reject ________

Test Performed by VN — Date 7-27-98
Litton Q.A. — Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.22B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A
SERIAL NUMBER: 85079 QUAL TEST N/A

AESD 1336610- 8
ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION			LIMITS
4. Performance at Tnom ± 1°C at Ambient Pressure			
Temperature	22	°C	Tnom ± 1°C
Frequency, f_{meas}	55.50027	GHz	Table IIIB
RF Output Power, P_{meas}	12.4	dBm	12 to 17 dBm
Input Voltage, V_B	10	VDC	V_B ± .0005 VDC
Input Current	181	mA	Table IIIB

Calculate frequency variation, $\Delta f_P = f_{meas} - f_{Tnom}$:

Δf_P = -0.03 MHz

Calculate RF output power variation, $\Delta P_p = P_{meas} - P_{Tnom}$:

ΔP_p = 0.1 dB

Accept ✓ Reject ________

Test Performed by DM Date 7-28-98

Litton Q.A. LITTON Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 59 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.23A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AK/A
SERIAL NUMBER: 85079
QUAL TEST N/A
AESD 1336610- 8
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Initial Measurement. Ref Test Par. 5.9.1			
Temperature	23	°C	24°C ± 5°C
Frequency	RH ~~5~~55.50023	GHz	Table IIIB
RF Output Power	12.4	dBm	12 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current	181	mA	Table IIIB

Reference test. Ref. Test Para. 5.9.3

Frequency, f_{Ref}	55.50023	GHz	Table IIIB
RF Output Power, P_{Ref}	-3.2	dBm	

Load Pulling Test. Ref. Test Para. 5.9.4

Maximum Frequency, f_{meas}	55.50024	GHz	Table IIIB
Minimum Frequency, f_{meas}	55.50023	GHz	Table IIIB
Maximum RF Output Power P_{meas}	-2.8	dBm	
Minimum RF Output Power, P_{meas}	-3.7	dBm	

Calculate maximum positive (f_{meas} is greater than f_{Ref}) and negative (f_{meas} is less than f_{Ref}) frequency variation, $\Delta f_L = f_{meas} - f_{Ref}$:

Maximum Positive Δf_L = 0.01 MHz
Maximum Negative Δf_L = 0 MHz

Calculate maximum positive (P_{meas} is greater than P_{Ref}) and negative (P_{meas} is less than P_{Ref}) RF Output Power Variation, $\Delta P_L = P_{meas} - P_{Ref}$:

Maximum Positive ΔP_L = 0.4 dB
Maximum Negative ΔP_L = -0.5 dB

Accept ✓ Reject ______

Test Performed by RH Date 7-28-98
Litton Q.A. LITTON Date JUL 30 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 60 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A | AESD 1336610- 8
SERIAL NUMBER: 85079 QUAL TEST N/A | ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	23	°C	24°C ± 5°C
Frequency:	55.500027	GHz	Table IIIB
RF Output Power:	12.4	dBm	12 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current:	181	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	0.32	MHz (Positive)	Table IIIB
	-0.22	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	0.01	MHz (Positive)	Table IIIB
	-0.26	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0.4	dB (Positive)	1.0 dB
	-0.7	dB (Negative)	-1.0 dB

Accept ✓ Reject ________

Test Performed by DM Date 7-28-98

Litton Q.A. LITTON M 60 Date JUL 30 1998

GAIN STABILITY AND GAIN COMPRESSION

FOR

MIXER/AMPLIFIERS AND IF AMPLIFIERS

GAIN-TEMPERATURE SENSITIVITY FOR MIXER/AMPLIFIERS AND IF AMPLIFIERS

Channel No.	3	4	5	6	7	8	9	10	11	12	13	14	15
Specification (+/-dB/°C)	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.04	0.06	0.06	0.06	0.06	0.02
Measured (dB/°C)	-0.015	-0.017	-0.015	-0.017	**-0.017**	**-.0152**	-0.020 +0.005	-0.020 +0.005	-0.020 +0.005, -0.005 -0.014	-0.020 +0.005, -0.005 -0.010	-0.020 +0.005. -0.005 +0.010 -0.005	-0.020 +0.005, -0.005 -0.020	-0.017
Total (dB/°C)	-0.015	-0.017	-0.015	-0.017	**-0.017**	**-.0152**	+0.005, -0.020	+0.005, -0.020	+0.005, -0.039	+0.005, -0.035	+0.015, -0.030	+0.005, -0.045	-0.017

Channel 8 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-18, S/N: 7A38)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.60	0,50		QA 1

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	70.86	1.0	2.0	QA 1	
10.00	70.90				
10.04	70.94				
ΔGv =	0.08 dB				

	DATE	ACC	REJ
PART NO. 1331562-18G SPACEK QA	6-29-98	QA 1	QA 1

SER NO. 7A38   TEST FAILURE: ______

TESTED BY: [illegible]   FAILURE ANALYSIS NO. ______

END DATE: 6-5-98

END TIME: 1600

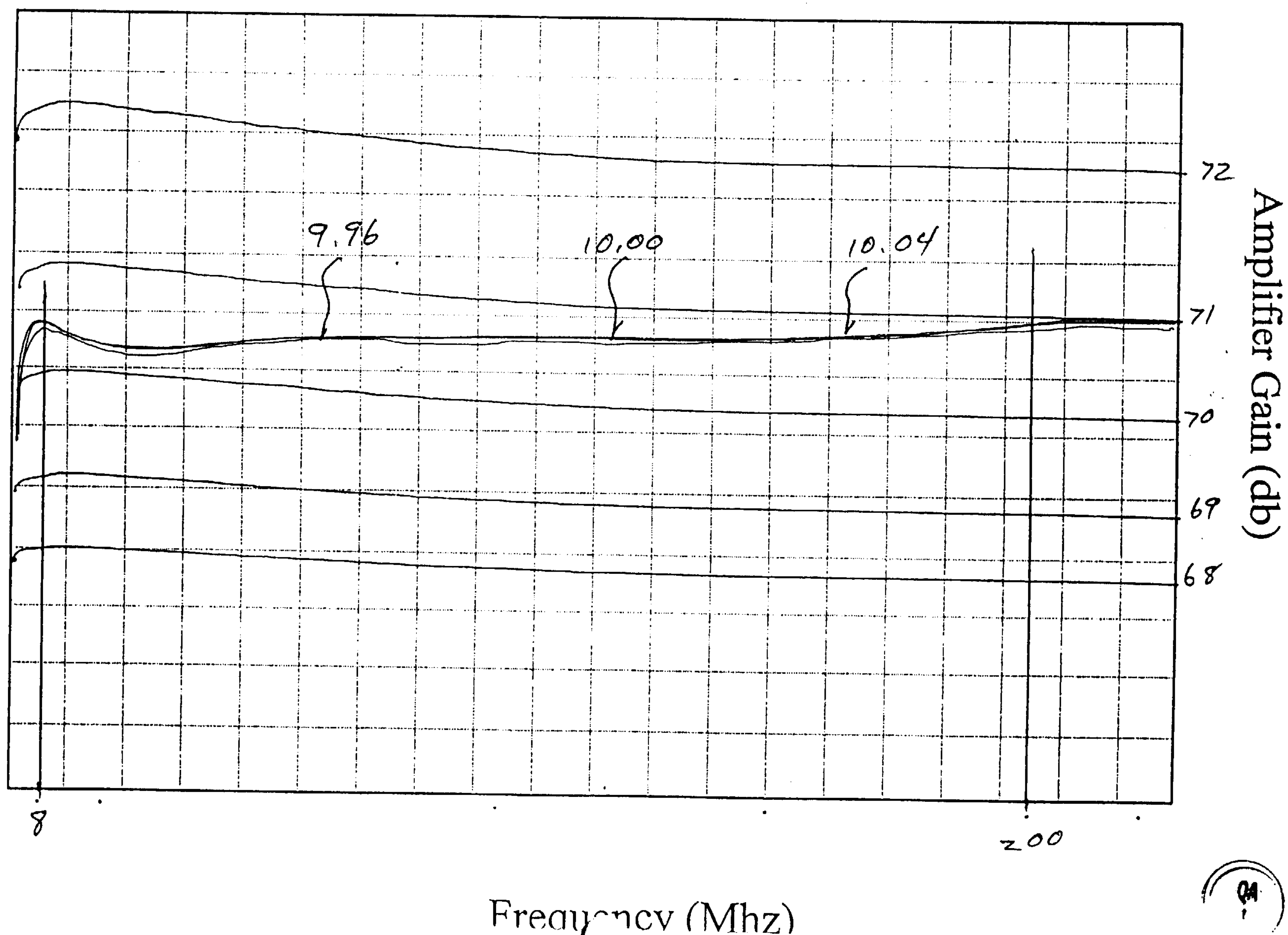
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Amb Temp 23°C

Model No. 1331562-186
Serial No. 7A38
Date 6-6-98
Tested By 777



TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 -6	GT1 71.63				
		* 0.015	0.035dB/°C	QA 1	
T2 +8	GT2 71.42				
		* 0.029	0.020dB/°C		QA 1
T3 +28	GT3 70.85				
		* 0.029	0.035dB/°C	QA 1	
T4 +40	GT4 70.50				

ECN CAMSU-1352

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4$$

ΔG_T = 1.13 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4$ = 1.61 dB Spec 1.4dB ACC____ REJ QA 1

ECN CAMSU-1352

	DATE	ACC	REJ
SPACEK QA	6-22-98		QA 1

PART NO. 1331562-186

SER NO. 7A38

TESTED BY: 771

END DATE: 6-5-98

END TIME: * 1600

TEST FAILURE: __________

FAILURE ANALYSIS NO. __________

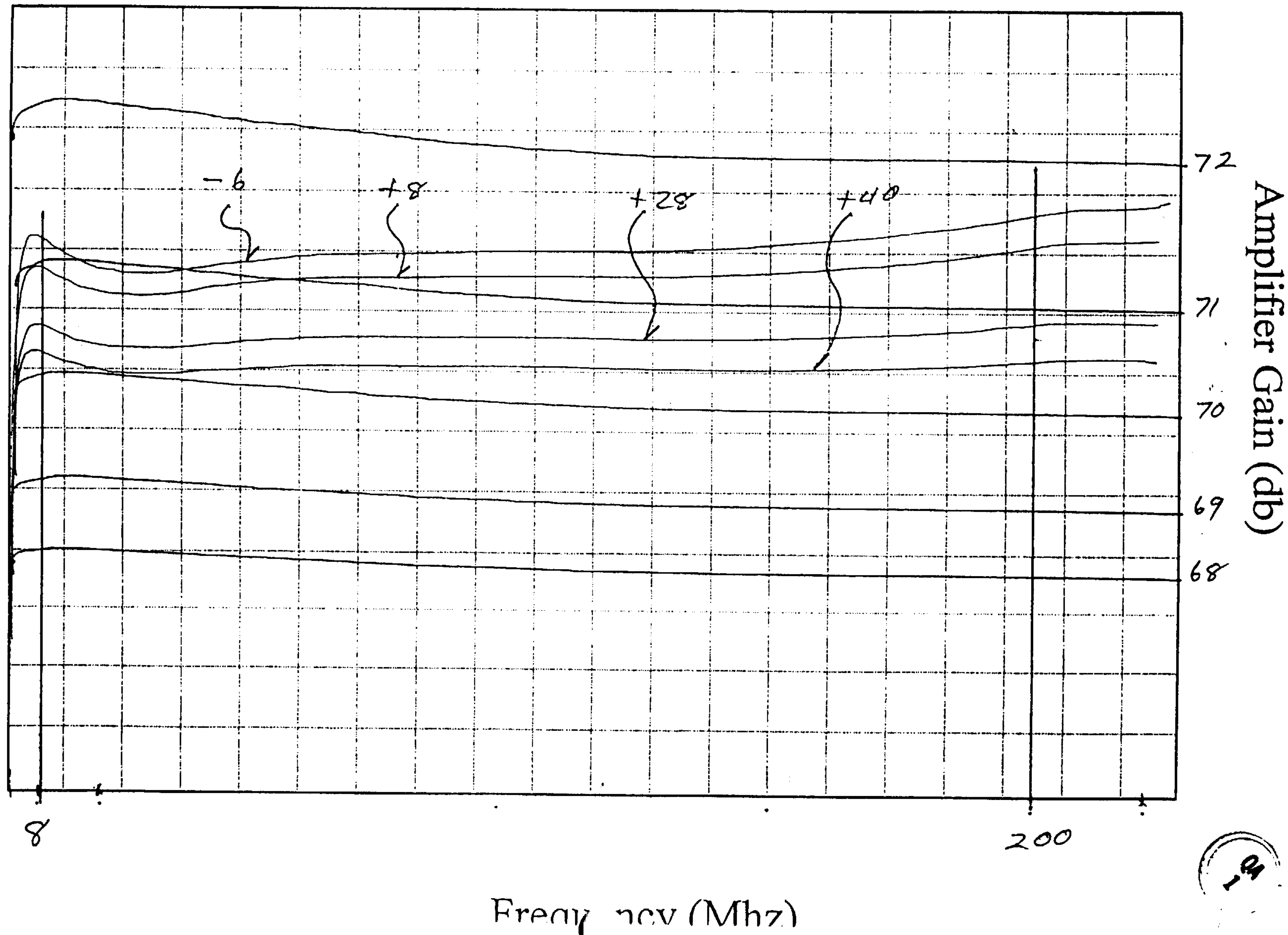
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-186
Serial No. 7A 38
Date 6-6-98
Tested By [illegible]

Amb Temp 23°C



TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.3	0.7	1.0	QA 1	
				X						20					
	X	X								50					
X	X	X	X	X	X	X	X			100	-2.4	0.6	1.0	QA 1	
X										150					
			X	X	X	X	X	X		200	-2.3	0.7	1.0	QA 1	
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 5/6/98 AMBIENT ROOM TEMPERATURE °C: 23°

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-21.4	-25.1	3.7	1.11

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

PART NO. 1331562- 18

SPACEK QA DATE 6-29-98 ACC QA 1 REJ

SER NO. 7A38

TEST FAILURE:

TESTED BY: [illegible]

FAILURE ANALYSIS NO.

END DATE: 6/5/98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 12. MIXER-AMPLIFIER ASSEMBLY TESTS

RF PORT RETURN LOSS TEST: ATP PARAGRAPH 5.4.6.

RF FREQ (GHZ)	TOTAL REFLECTED POWER (dBm)	UUT REFLECTED POWER (dBm)	RF RETURN LOSS (dB)	SPEC. RF RETURN LOSS (dB)	ACC	REJ
55.30	-3.0	-22.0	19.0	14.0	QA 1	
55.50	-3.4	-20.0	16.6	14.0	QA 1	
55.70	-4.0	-18.3	14.3	14.0	QA 1	

AVERAGE NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.4.7.

DATE: 6-25-98 AMBIENT ROOM TEMPERATURE °C: +21

	TOTAL POWER @ AMBIENT (dBm)	TOTAL POWER @ 77.2 DEG K (dBm)	Y FACTOR (dB)	DSB NOISE FIGURE (dB)	SPEC. DSB NOISE FIGURE (dB)	ACC	REJ
LO power level at +8.5dBm(with ripple)							
1ST	-19.50	-21.20	1.70	3.6	3.8		
2ND	-19.50	-21.20	1.70	3.6	3.8		
3RD	-19.50	-21.20	1.70	3.6	3.8		
AVG	-19.50	-21.20	1.70	3.6	3.8	QA 1	
LO power level at +10dBm(with ripple)							
1ST	-19.20	-20.90	1.70	3.6	3.8		
2ND	-19.20	-20.90	1.70	3.6	3.8		
3RD	-19.20	-20.90	1.70	3.6	3.8		
AVG	-19.20	-20.90	1.70	5.6	3.8	QA 1	
LO power level at +11.5dBm(with ripple)							
1ST	-19.00	-20.65	1.65	5.7	3.8		
2ND	-19.00	-20.65	1.65	3.7	3.8		
3RD	-19.00	-20.65	1.65	3.7	3.8		
AVG	-19.00	-20.65	1.65	3.7	3.8	QA 1	
+7dBm	-19.80		1.70	3.6	3.8		

NOTE: *Above data was taken with the Daden filte, except on the -19 unit.*

PART NO. 1331562-18B

SPACEK QA DATE 6-29-98 ACC. QA 1 REJ

SER NO. 7A38

TEST FAILURE:

TESTED BY: QJ

FAILURE ANALYSIS NO.

END DATE: 6-25-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA

FOR

SPARE CHANNEL 8

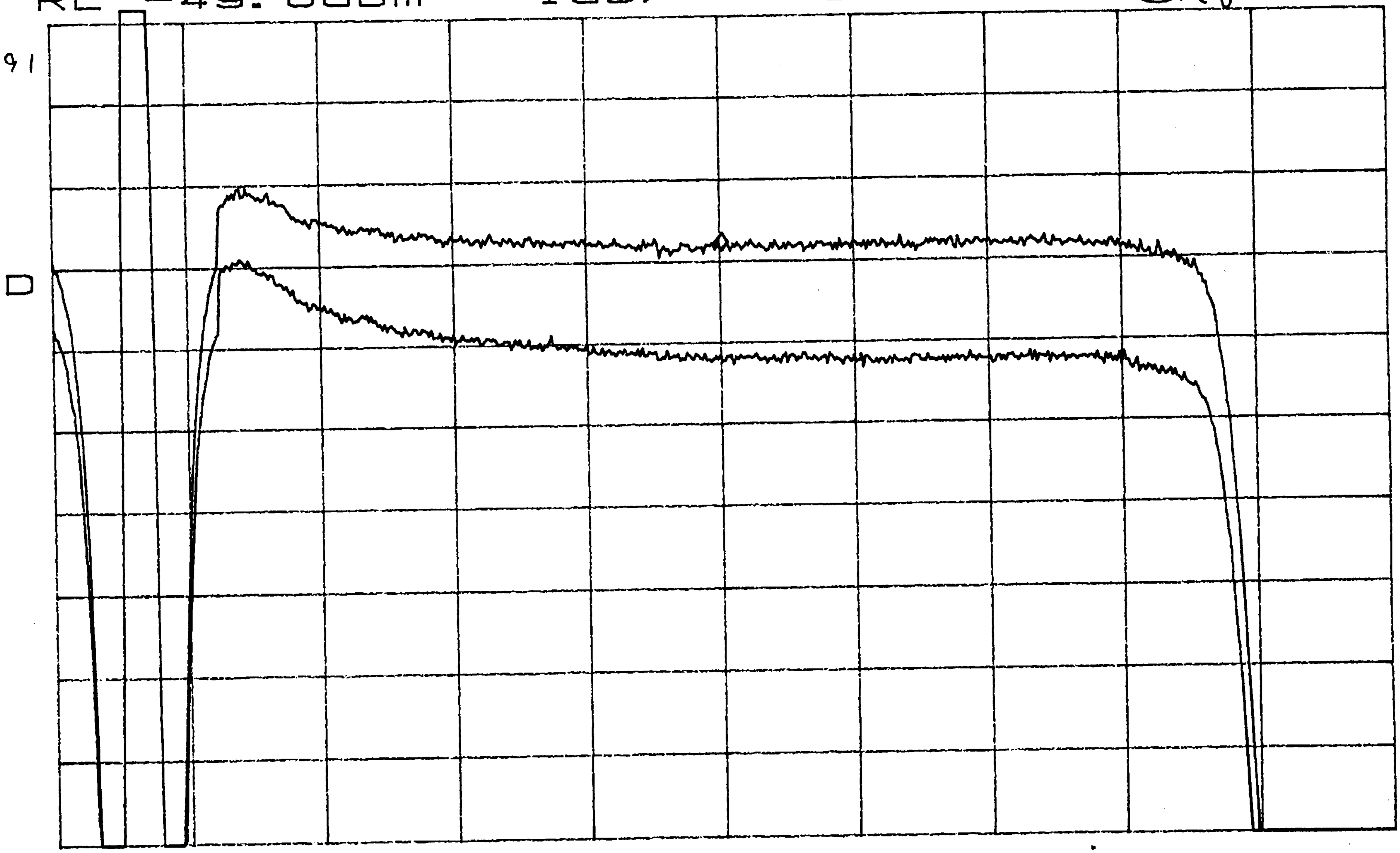
For Ref only

2 °C
L_c = 9.95 dB

10/27/98 P/N 13-0610-8
S/O 778372
OP 0030 S/N 85079

*ATTEN 10dB FOR REFERENCE ONLY MKR −51.85dBm
RL −49.0dBm 1dB/ 87.8MHz Ch8

JF 9.391



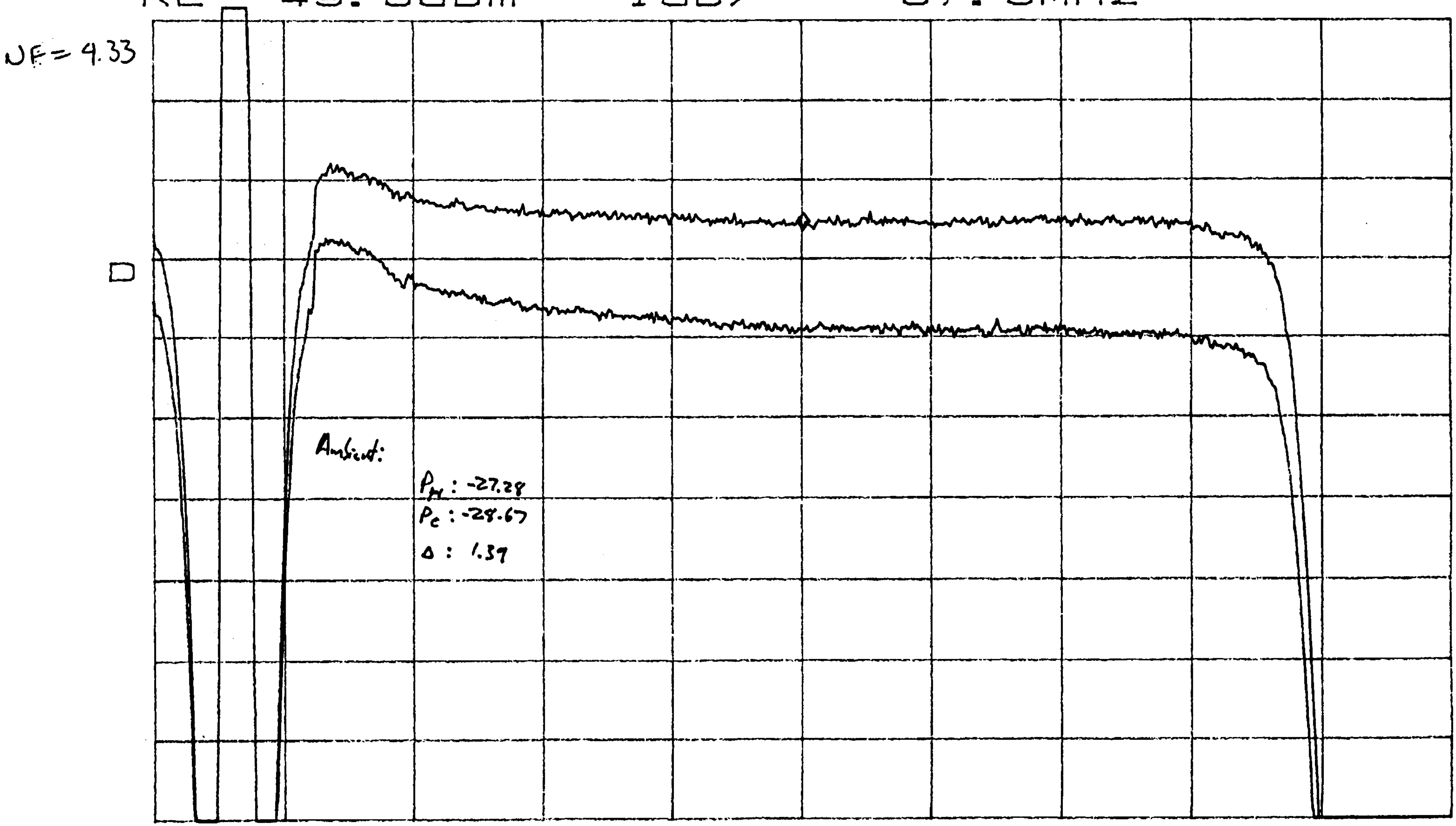
CENTER 87.5MHz SPAN 200.0MHz
*RBW 1.0MHz *VBW 30Hz *SWP 20.0sec

START 22°C

P/N 1336610-8
S/N 85079

FOR REFERENCE ONLY

*ATTEN 10dB MKR -51.62dBm
RL -49.0dBm 1dB/ 87.8MHz



CENTER 87.5MHz SPAN 200.0MHz
*RBW 1.0MHz *VBW 30Hz *SWP 20.0sec

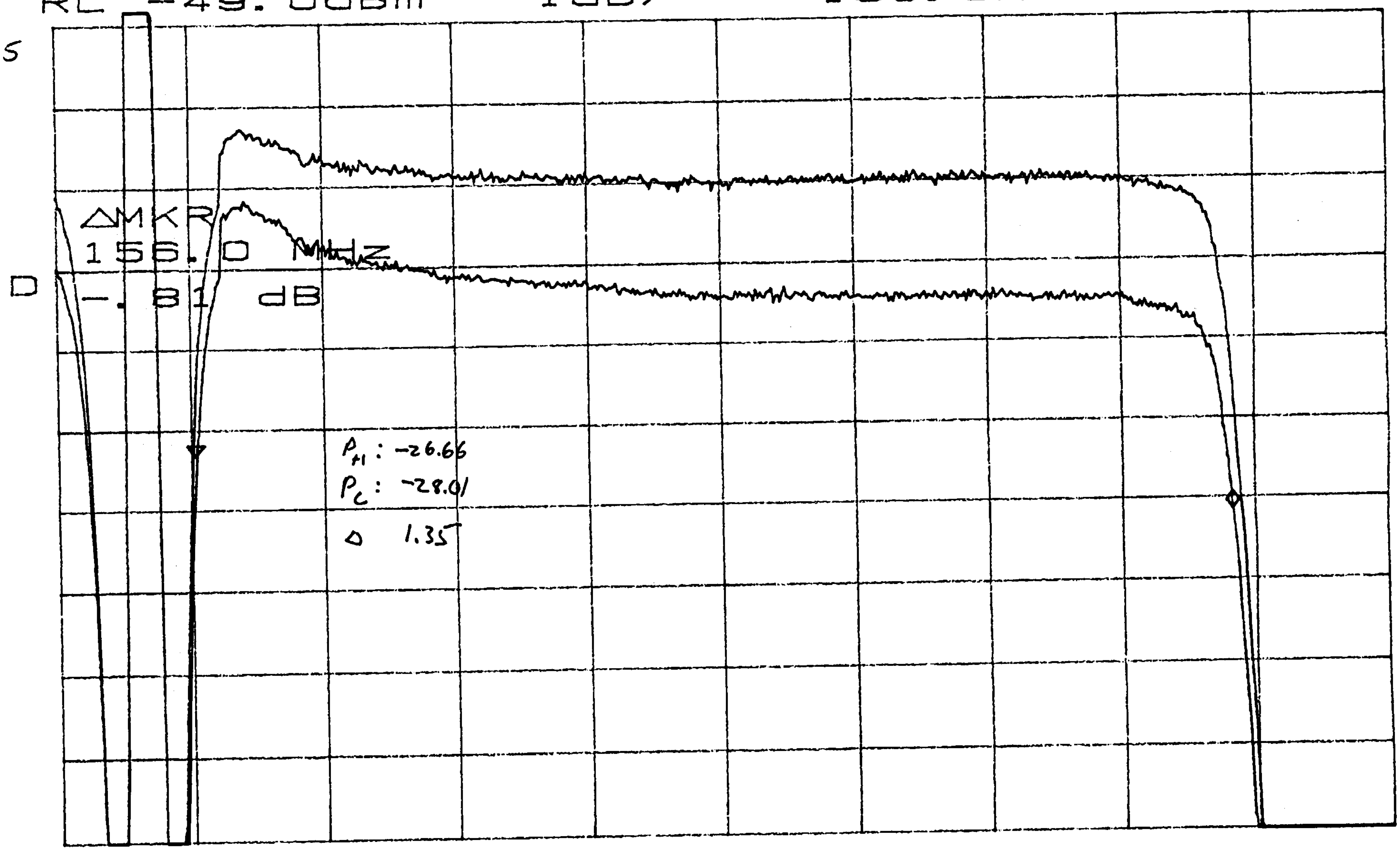
P/N 1336610-8
S/N 85079

-20R

FOR REFERENCE ONLY

*ATTEN 10dB
RL -49.0dBm 1dB/
ΔMKR -.81dB
156.0MHz

NF=4.45



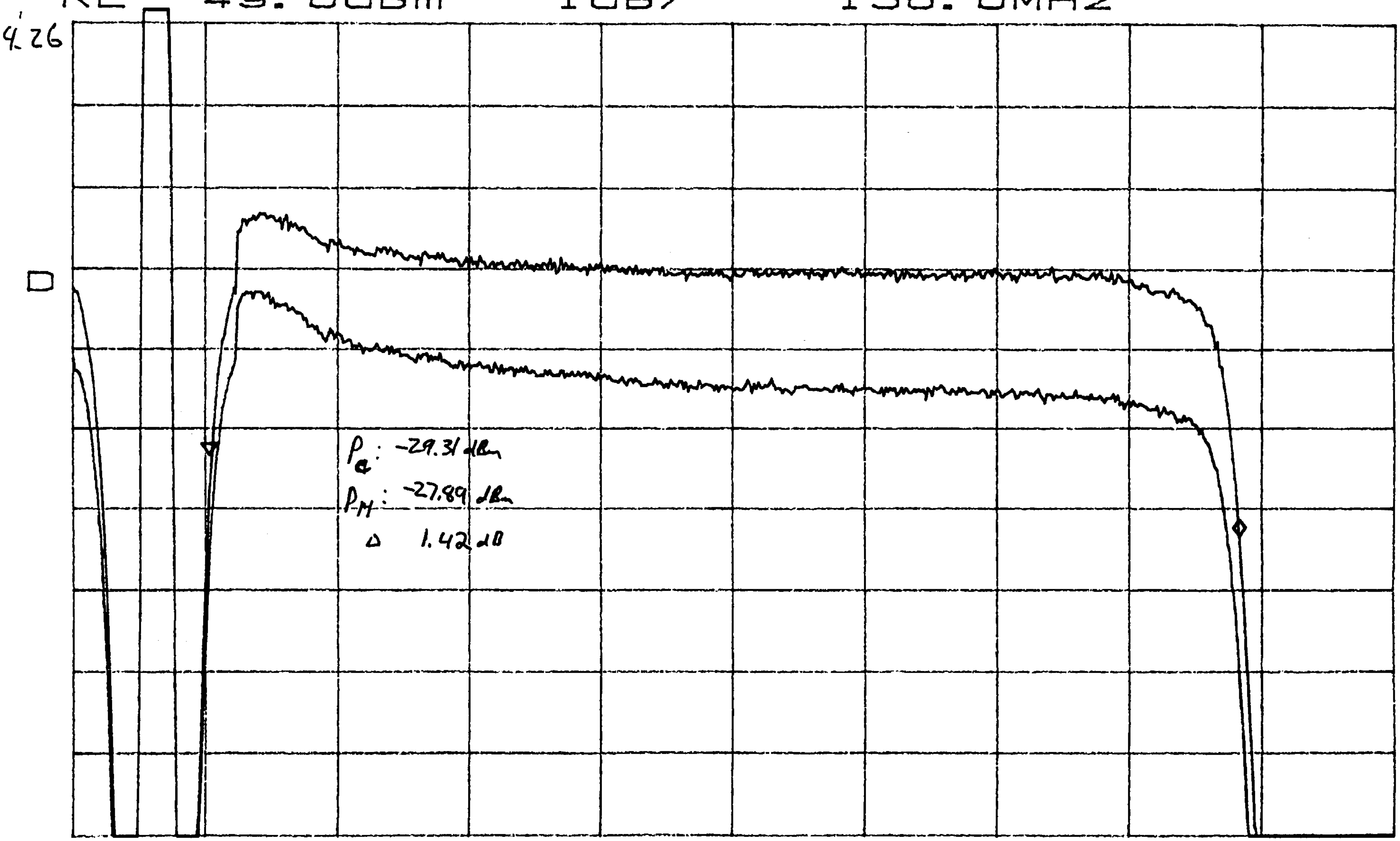
CENTER 87.5MHz
*RBW 1.0MHz *VBW 30Hz
SPAN 200.0MHz
*SWP 20.0sec

50°C

P/N 1336610-8
S/N 85079

*ATTEN 10dB **FOR REFERENCE ONLY** ΔMKR -1.01dB
RL -49.0dBm 1dB/ 156.0MHz

NF = 4.26



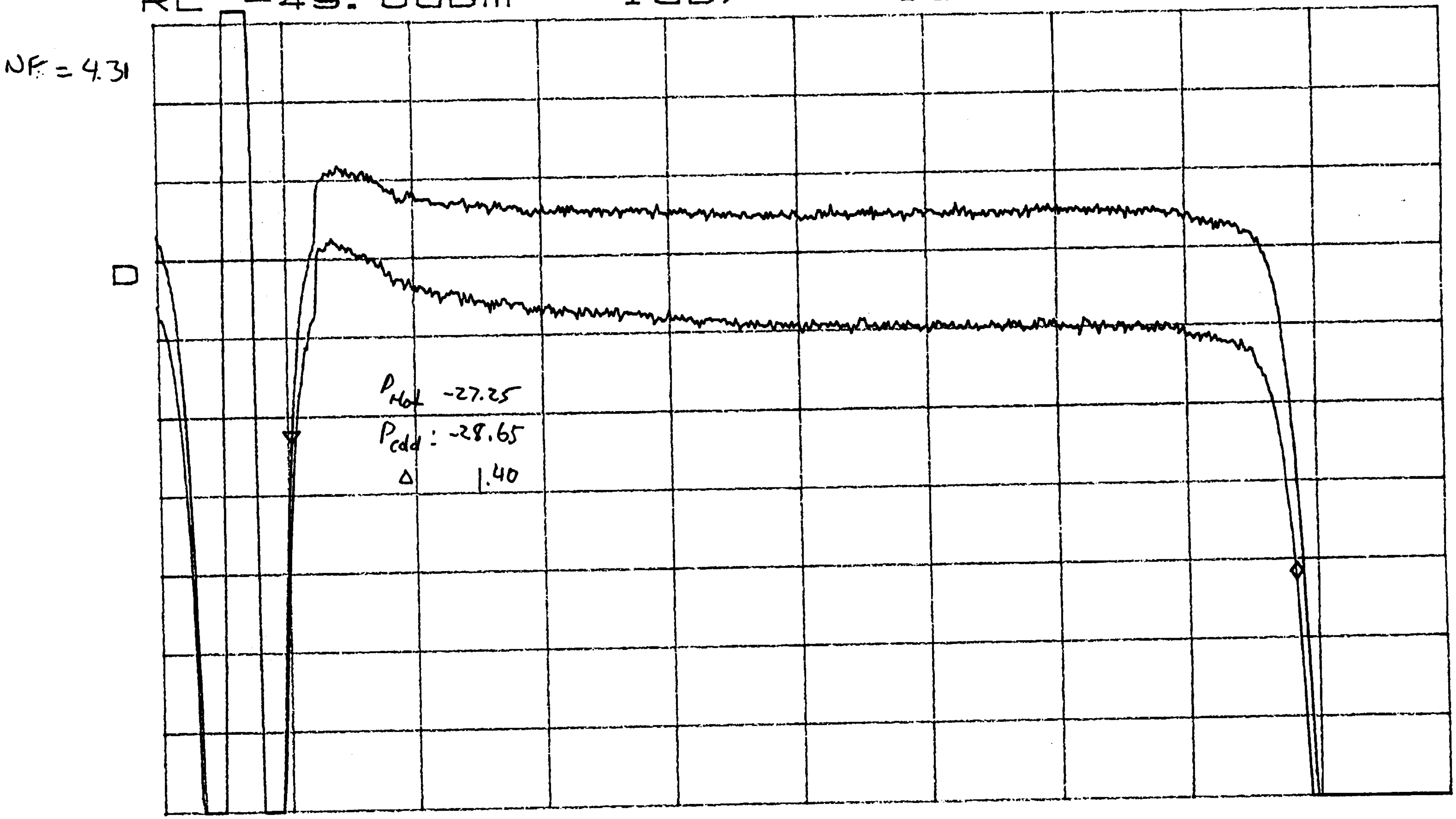
CENTER 87.5MHz SPAN 200.0MHz
*RBW 1.0MHz *VBW 30Hz *SWP 20.0sec

Finish 220C

P/N 1336610-8
S/N 85079

FOR REFERENCE ONLY

*ATTEN 10dB ΔMKR −1.93dB
RL −49.0dBm 1dB/ 156.0MHz



CENTER 87.5MHz SPAN 200.0MHz
*RBW 1.0MHz *VBW 30Hz *SWP 20.0sec

Eng. Eval opr. 0044 S/10778372 P/N 133610-8

TEST DATA SHEET 8 (Sheet 1 of 2)
Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-2)

Test Setup Verified: [signature]
Signature

Baseplate Temperature (T_B) 21 °C

Compo-nent	Channel No.	V_b(V)	I_b(mA)	3 dB BW Frequency (MHz)		3 dB BW Frequency (MHz)		Pass/ Fail
				Lower	Higher	Required Max.	Measured	
LO	3					90		
	4					200		
	5					170		
	8	10.0 V	1785 mA	8.2	164.2	163	156 MHz	Pass
Mixer/ Amps	All	10.0V	42.6 mA					

[signature] 11/1/99

Part No.: 133610-8

Serial No.: 85079

opr. 0044

Test Engineer: [signature]

Quality Assurance: N/A [signature] 11/16/99

Date: 11/1/99

TEST DATA SHEET 11 (Sheet 4 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: [signature] Signature   Baseplate Temperature (T_B) 23°C °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	8	9.99v	178	24	-.89328	.000167	-194	-.62254765	.00026309
				24	-.8923	.000186	-194	-.62160555	.00015748
				24	-.893229	.00019976	-194	-.62097696	.00017929
				24	-.8930579	.00019100	-194	-.62006780	.00015977
				24	-.8929469	.00016746	-194	-.61969373	.00014458
				24	-.89288789	.00015026	-194	-.61927677	.00017775
				24	-.8929744	.00011364	-194	-.61910364	.00013699
				24	-.892842	.00020065	-194	-.61885912	.00019466
				24	-.8926138	.00020379	-194	-.61848914	.00023365
				24	-.8926242	.00019696	-194	-.61802504	.00014334
Mixer/ Amps	All	10.05V	42.7						

Part No.: 1336610-8
Serial No.: 85079
Oper. 0030

Test Engineer: [signature]
Quality Assurance: QA 268 NOV 8 '99
Date: 11-5-99

TEST DATA SHEET 11 (Sheet 8 of 8)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: Gary Launder
Signature

Baseplate Temperature (T_B) 23°C °C

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
8		3.90				.032			
		3.89				.057			
		3.88				.079			
		3.86				.066			
		3.86				.032			
		3.89				.067			
		3.84				.071			
		3.85				.082			
		3.89				.087			
		3.84				.080			
	5.0		3.86	P	0.08		.065	.055 ~~.057~~ Gary Launder 11/5/99	P

Pass = P, Fail = F

Part No.: 1336610-8

Serial No.: 85079

Oper. 0030

Test Engineer: Gary Launder

Quality Assurance: TA 26 NOV 8 '99

Date: 11/5/99

OP 0030
S/O 778372
P/N 1336~~60~~-8
S/N 85079

For Ref only
ENG Data

FOR REFERENCE ONLY

AMSU-A TEST

Channel 8, 11/3/99 LO-10.0

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	297.15	-.85327722	.00016736	----------	---------
2	COLD TEST	79.15	-.62254765	.00026309	3.90170444	.03280399
3	WARM TEST	297.15	-.85323084	.00018627	----------	---------
4	COLD TEST	79.15	-.62160555	.00015748	3.88698739	.05692631
5	WARM TEST	297.15	-.85322924	.00019876	----------	---------
6	COLD TEST	79.15	-.62097656	.00017929	3.87666539	.07942947
7	WARM TEST	297.15	-.85305798	.00019100	----------	---------
8	COLD TEST	79.15	-.62006780	.00019377	3.86415028	.06997798
9	WARM TEST	297.15	-.85294697	.00016746	----------	---------
10	COLD TEST	79.15	-.61968373	.00014456	3.85921904	.03199666
11	WARM TEST	297.15	-.85288739	.00015026	----------	---------
12	COLD TEST	79.15	-.61927677	.00017775	3.85395298	.06697981
13	WARM TEST	297.15	-.85297446	.00019368	----------	---------
14	COLD TEST	79.15	-.61910364	.00013699	3.84961058	.07098678
15	WARM TEST	297.15	-.85284200	.00020065	----------	---------
16	COLD TEST	79.15	-.61885912	.00019466	3.84716912	.08200002
17	WARM TEST	297.15	-.85261364	.00020379	----------	---------
18	COLD TEST	79.15	-.61846914	.00023365	3.84377361	.08677004
19	WARM TEST	297.15	-.85262426	.00019690	----------	---------
20	COLD TEST	79.15	-.61802504	.00014334	3.83623711	.07590752

CH. 8 ,169 MHz MHz

NOISE FIGURE AVERAGE (dB) - 3.86135129103

NOISE POWER STABILITY (K) - .0649330748536

NOISE POWER STABILITY DELTA (K) - .0548131752158

NPS_MAX (K) - .0867700361854 NPS_MIN (K) - .0319956609636

INTEGRATION TIME - .165

SHOP ORDER

SHOP ORDER NUMBER	SPLIT REFERENCE	COMPLETION DATE	PART DESCRIPTION	PART NUMBER	DWG REV	PLN REV
778372			STABLE OSCILLATOR	1336610-8	*	01

	WORK CENTER		OPERATION DESCRIPTION	STAMP PROD	STAMP INSP	SETUP RUN TIME	IR's/EQCR's/TAR's/TRR' COMMENTS
			THIS SHOP ORDER WILL DOCUMENT ENGINEERING EVALUATION TESTING FOR SPARE CH 8 ON THE A1-2 RECEIVER ASSEMBLY. **NOTE:** THIS ASSEMBLY CONTAINS STATIC SENSITVE COMPONENTS. HANDLE IN ACCORDANCE WITH MPI 09-008.				
0000100	PC 7GPAS	A	RELEASE S/O	I.P. 4 9/22/99			
		B	ISSUE THE FOLLOWING PARTS AND RECORD THE S/N'S AND TRACE ID'S P/N 1336610-8, STABLE OSCILLATOR S/N 85079 TRACE ID A518131 P/N 1331562-18, MIXER/ AMP: S/N 7A38 TRACE ID L00043065 P/N 1356680-6, ISOLATOR: S/N 08 TRACE ID L00029714 P/N 1331509-6, WAVEGUIDE ATTENUATOR: S/N 103 TRACE ID A516319 P/N 1331559-4, BANDPASS FILTER: S/N P230-016 TRACE ID L00033209	I.P. 4	9/22/99		
9/22/99 QC 237 ME 44	MFG.		Solder Test leads to the stable Oscillator And the Mixer/IF Amp	MFG 132 9/22/99			
0010100	TEST 7ATTS	A	SET UP TEST EQUIPMENT TO PERFORM ENGINEERING EVALUATION W.G. ATTENUATOR ADJUSTMENT, NOISE FIGURE, NOISE POWER STABLITY AND 3 dB BANDPASS CHARACTERISTIC TEST PER AE-26002/6, PARA ~~3.5.3~~ AND 3.5.4 Add: Power Meter Power Sensor Microwave Counter	MFG 188 QC 237 ME 44	9/23/99		
		B	NOTIFY INSPECTION TEST SET-UP IS READY	9/23/99 MFG 188			

Channel 7 LO
DRO (P/N: 1336610-7, S/N: 85023)

LITTON
Solid State

TEST DATA SHEET 7.28
MECHANICAL MEASUREMENTS
FINAL DATA SET

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A

AESD 1336610- 7
ACCEPT TEST ✓

Weight Ref. Test Para. 6.1.

SPECIFICATION	MEASUREMENT	LIMIT
Weight:	1 lb 4.2oz	1.5 pounds max.

Accept ✓ Reject ______

Inspection Performed By: LITTON M C0 Date: JUL 2 8 1998

Litton Q.A. LITTON M C0 Date: JUL 2 8 1998

Outline and Marking

Ref. Test Para. 6.2, Inspection to Outline drawing, Litton 1300316 B1

Accept ✓ Reject ______

Inspection Performed by: LITTON M 60 Date: JUL 2 8 1998

Litton Q.A. LITTON M 60 Date JUL 2 8 1998

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A

AESD 1336610- 7
ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	194 mA	Table IIIB
Input Power, P_{diss}	1.94 W DC	P_{diss} max
Frequency, f_{Tnom}	54.94028 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.5 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.28 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	191 mA	Table IIIB
Frequency, f_{meas}	54.94021 GHz	Table IIIB
RF Output Power, P_{meas}	12.5 dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	192 mA	Table IIIB
Frequency, f_{meas}	54.94021 GHz	Table IIIB
RF Output Power, P_{meas}	12.5 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 VDC = −0.07 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = −0.07 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 VDC = ø dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ø dB

Accept ✓ Reject ____

Test Performed by VHO Date 7-22-98
Litton QA LITTON M 60 Date JUL 28 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AJ/A AESD 1336610- 7
SERIAL NUMBER: 85023 QUAL TEST N/A ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10	°C	10° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	193	mA	Table IIIB
Input Power, P_{diss}	1.93	W DC	Pdiss max
Frequency, $f_{10°C}$	54.94043	GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.55	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	54.94042	GHz	Table IIIB
RF Output Power, P_{meas}	12.55	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	54.94043	GHz	Table IIIB
RF Output Power, P_{meas}	12.55	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5 VDC = -0.01 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = ∅ MHz
Δf_T at 10.0 VDC ($= f_{10°C} - f_{Tnom}$) = 0.15 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ∅ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ∅ dB
ΔP_T at 10.0 VDC ($= P_{10°C} - P_{Tnom}$) = 0.05 dB

Accept ✓ Reject ________

Test Performed by VN Date 7-22-98
Litton Q.A. LITTON M CO Date JUL 2 8 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A AESD 1336610- 7
SERIAL NUMBER: 85023 QUAL TEST N/A ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	193	mA	Table IIIB
Input Power, P_{diss}	1.93	W DC	Pdiss max
Frequency, f_{Tmin}	54.94017	GHz	Table IIIB
RF Output Power, P_{Tmin}	12.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	54.94017	GHz	Table IIIB
RF Output Power, P_{meas}	12.7	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	54.94019	GHz	Table IIIB
RF Output Power, P_{meas}	12.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	Ø	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	0.02	MHz
Δf_T at 10.0 VDC ($=f_{Tmin} - f_{Tnom}$)		-0.11	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	Ø	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	Ø	dB
ΔP_T at 10.0 VDC ($=P_{Tmin} - P_{Tnom}$)	=	0.2	dB

Accept ✓ Reject ____

Test Performed by VW Date 7-22-98
Litton Q.A. LITTON Date JUL 28 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 40 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AJ/A AESD 1336610- 7
SERIAL NUMBER: 85023 QUAL TEST N/A ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	30 °C	30° ± 1°C
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	194 mA	Table IIIB
Input Power, P_{diss}	1.94 W DC	Pdiss max
Frequency, $f_{30°C}$	54.94009 GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.5 dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	30 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	192 mA	Table IIIB
Frequency, f_{meas}	54.94011 GHz	Table IIIB
RF Output Power, P_{meas}	12.5 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	30 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	192 mA	Table IIIB
Frequency, f_{meas}	54.94010 GHz	Table IIIB
RF Output Power, P_{meas}	12.5 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:
Δf_V at 9.5 VDC or at 9.5 VDC = 0.02 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0.01 MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$) = −0.19 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:
ΔP_V at 9.5 VDC or at 9.5 VDC = ϕ dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ϕ dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$) = ϕ dB

Accept ✓ Reject ______

Test Performed by VN Date 7-22-98
Litton Q.A. LITTON M 60 Date JUL 28 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A AESD 1336610- 7
SERIAL NUMBER: 85023 QUAL TEST N/A ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	195	mA	Table IIIB
Input Power, P_{diss}	1.95	W DC	Pdiss max
Frequency, f_{Tmax}	54.93951	GHz	Table IIIB
RF Output Power, P_{Tmax}	12.1	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	193	mA	Table IIIB
Frequency, f_{meas}	54.93951	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	194	mA	Table IIIB
Frequency, f_{meas}	54.93951	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at 9.5 VDC = ø MHz
Δf_V at 10.5 VDC or at 10.5 VDC = ø MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$) = 0.23 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at 9.5 VDC = ø dB
ΔP_V at 10.5 VDC or at 10.5 VDC = ø dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$) = −0.4 dB

Accept ✓ Reject ____

Test Performed by VN Date 7-22-98
Litton Q.A. LITTON Date JUL 28 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.7
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A AESD 1336610- 7
SERIAL NUMBER: 85023 QUAL TEST N/A ACCEPT TEST ✓

Power Supply Immunity, Ref. Test Para. 5.2.4

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Initial Measurement			
Temperature	22	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	194	mA	Table IIIB
Input Power	1.94	W DC	Pdiss max
Frequency (f_{Tnom})	54.94029	GHz	Table IIIB
RF Output Power	12.5	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.29	MHz	

Performance After Short Circuit on Power Supply: Ref Test Para 5.2.4.2

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	194	mA	Table IIIB
Input Power	1.94	W DC	Pdiss max
Frequency	54.94029	GHz	Table IIIB
RF Output Power	12.5	dBm	12 to 17 dBm

Over Voltage: Ref Test Para 5.2.4.3

Overvoltage Input Voltage	28	VDC	+28V

Performance After Input Overvoltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	194	mA	Table IIIB
Input Power	1.94	W DC	Pdiss max
Frequency	54.94031	GHz	Table IIIB
RF Output Power	12.5	dBm	12 to 17 dBm

Reverse Polarity: Ref Test Para 5.2.4.4

Reverse Input Voltage	-10	VDC	-10.0 ± 0.2 VDC

Performance After Reverse Input Voltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	193	mA	Table IIIB
Input Power	1.93	W DC	Pdiss max
Frequency, f_{Tnom}	54.94032	GHz	Table IIIB
RF Output Power	12.5	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.32	MHz	

Accept ✓ Reject
Test Performed by VN Date 7-22-98
Litton Q.A. LITTON M 60 Date JUL 2 8 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 43 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.8
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A

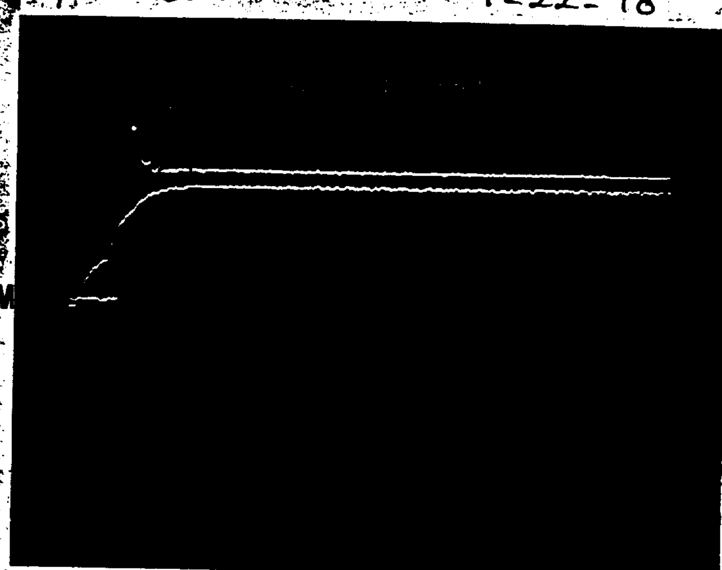
AESD 1336610- 7
ACCEPT TEST ✓

Maximum Instantaneous Current, Ref. Test Para. 5.3

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Temperature:	22	°C	Tnom ± 1°C
Input Voltage:	10	VDC	10.0 ± 0.2 VDC
Maximum Instantaneous Current:	296	mA	Table IIIB

Attach photograph

S/N 85023 VN 7-22-98



Max. Inst. current = 296 mA

Accept ✓ Reject ______

Test Performed by VN Date 7-22-98

Litton Q.A. LITTON M 60 Date JUL 2 8 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 44 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.9
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A
AESD 1336610- 7
ACCEPT TEST ✓

Start up at Survival Temperature Extremes, Ref. Test Para. 5.4

Turn-On Characteristics at -30° ± 1°C
Ref. Test Para. 5.4.3

Temp °C	Vop VDC	Iop mA	Freq. GHz	Pout dBm
-30	10	190	54.94090	12.8

Turn-On Characteristics at +60° ± 1°C
Ref. Test Para. 5.4.5

Temp °C	Vop VDC	Iop mA	Freq. GHz	Pout dBm
60	10	196	54.93873	12.0

Test Performed by VN Date 7-22-98

Litton Q.A. LITTON 41 Date JUL 28 1998

LITTON
Solid State

TEST DATA SHEET 7.10
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A

AESD 1336610- 7
ACCEPT TEST ✓

Spurious Outputs: Ref. Test Para. 5.5.2

TEST DESCRIPTION			LIMITS
Temperature	22 °C		Tnom ± 1°C
Spurious Outputs Peaks observed:	YES	✓	NO
Value of peaks observed, if any:	NONE		-90 dBc min

Attach Spurious Signals plots from Spectrum Analyzer.

Accept ✓ Reject ______

Test Performed by VN Date 7-24-98

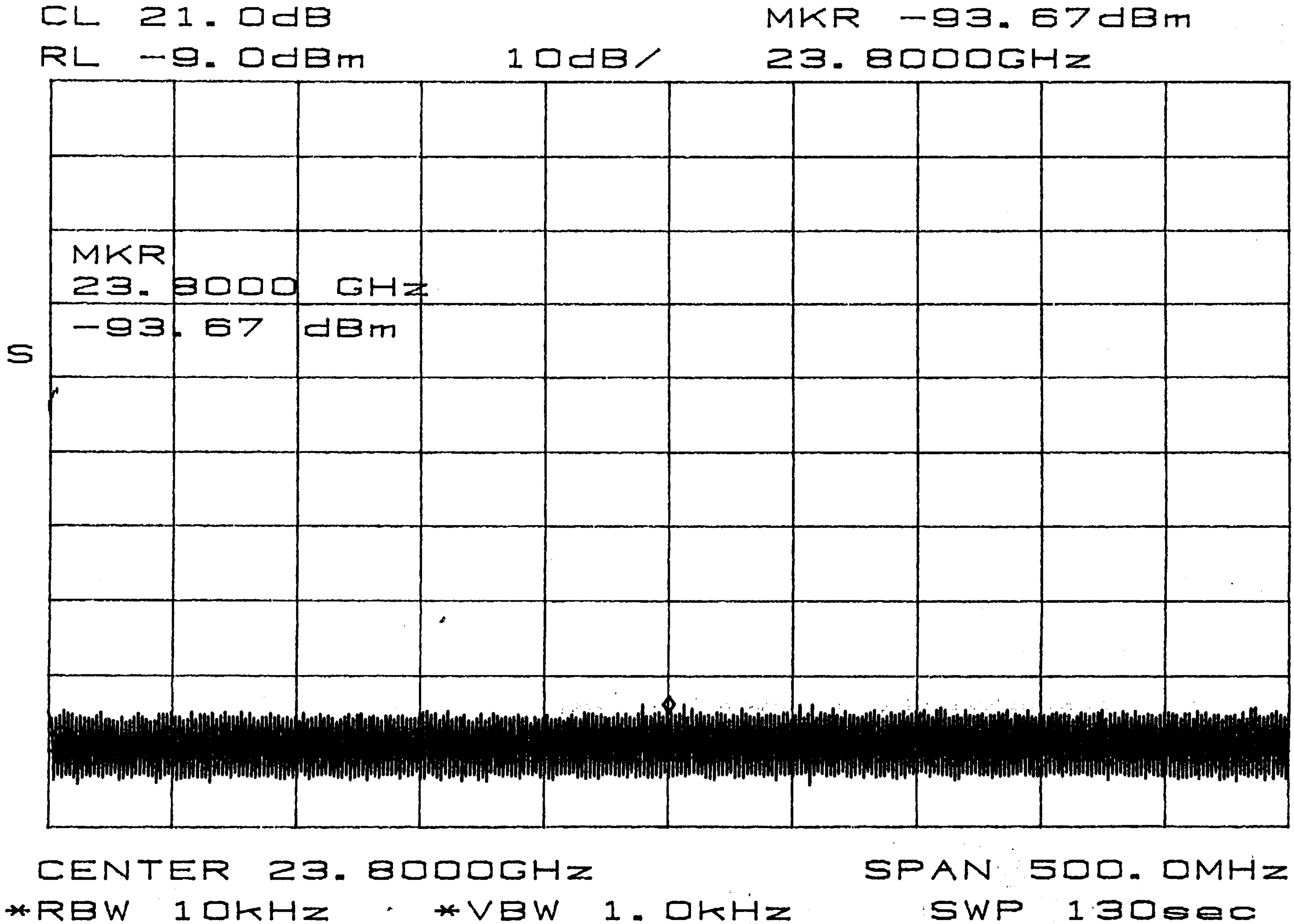
Litton Q.A. LITTON 09 Date JUL 2 8 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 46 OF 68
56348	A	1300823	B3	

7-24-98
S/N 85023 VN

SPURIOUS

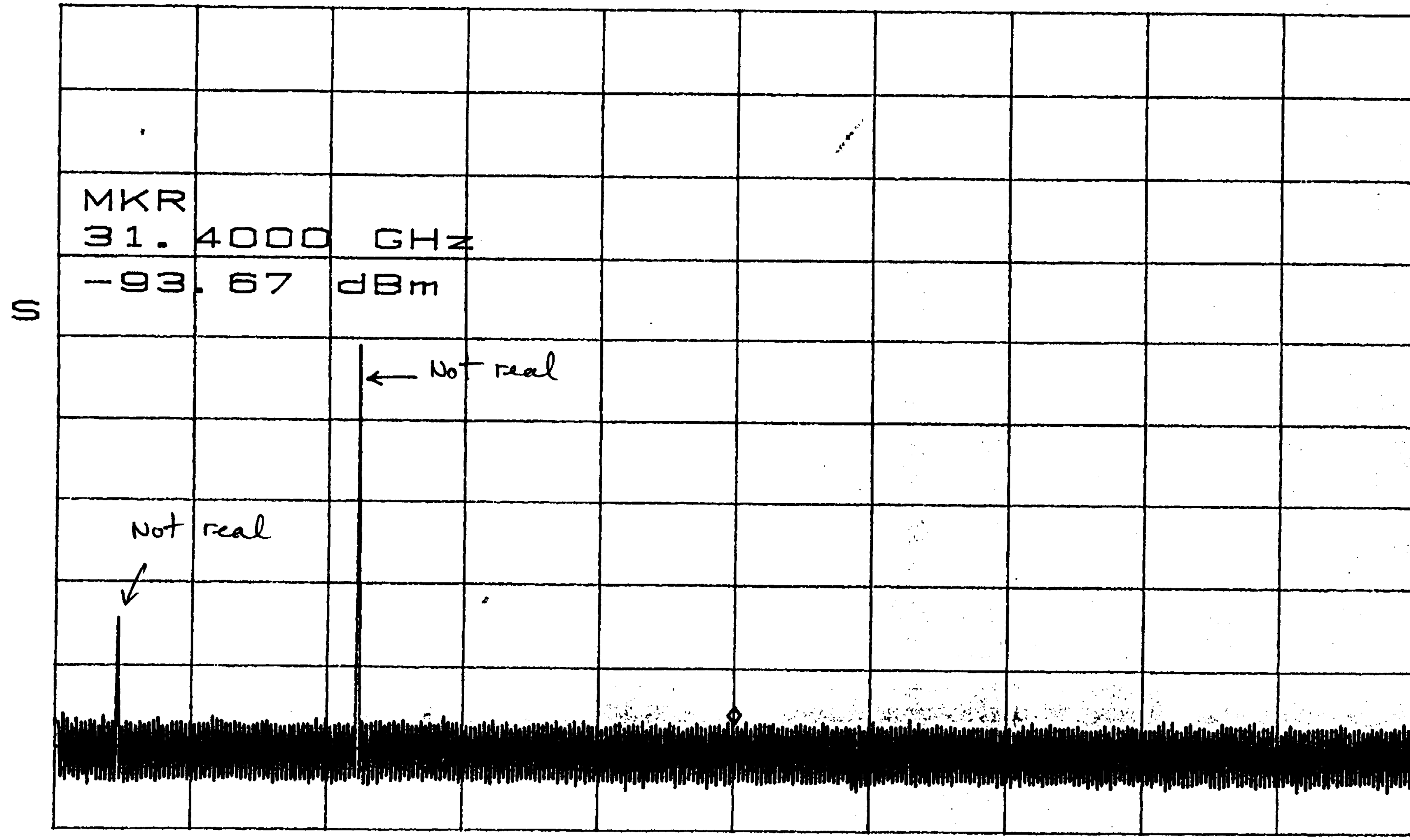
CL 21.0dB
RL -9.0dBm



1-24-48
S/N 85023 VN

SPURIOUS

CL 23.0dB MKR -93.67dBm
RL -7.0dBm 10dB/ 31.4000GHz



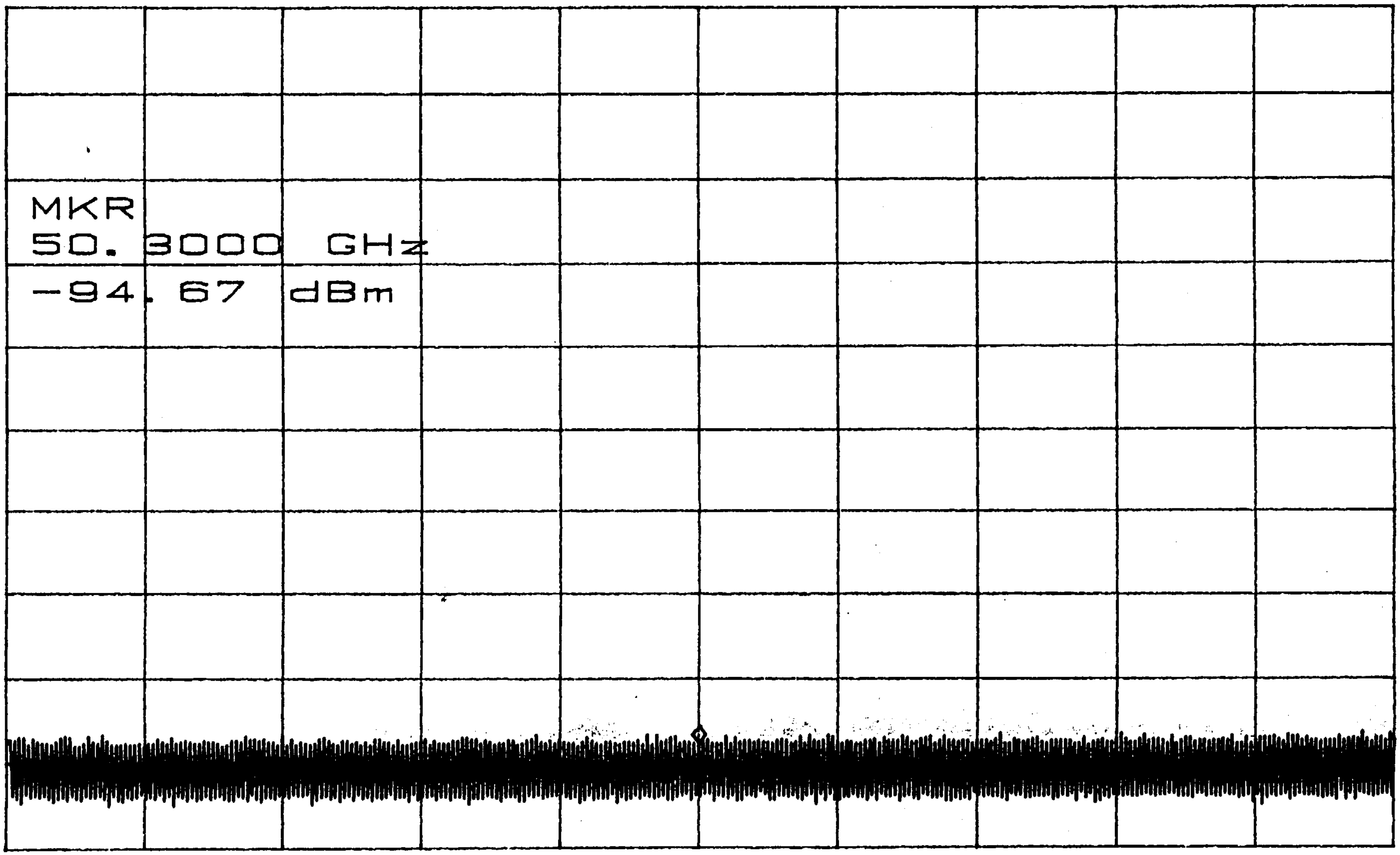
CENTER 31.4000GHz SPAN 500.0MHz
*RBW 10kHz *VBW 1.0kHz SWP 130sec

7-23-98
S/N 85023 VN

SPURIOUS

CL 23.0dB MKR -94.67dBm
RL -7.0dBm 10dB/ 50.3000GHz

S

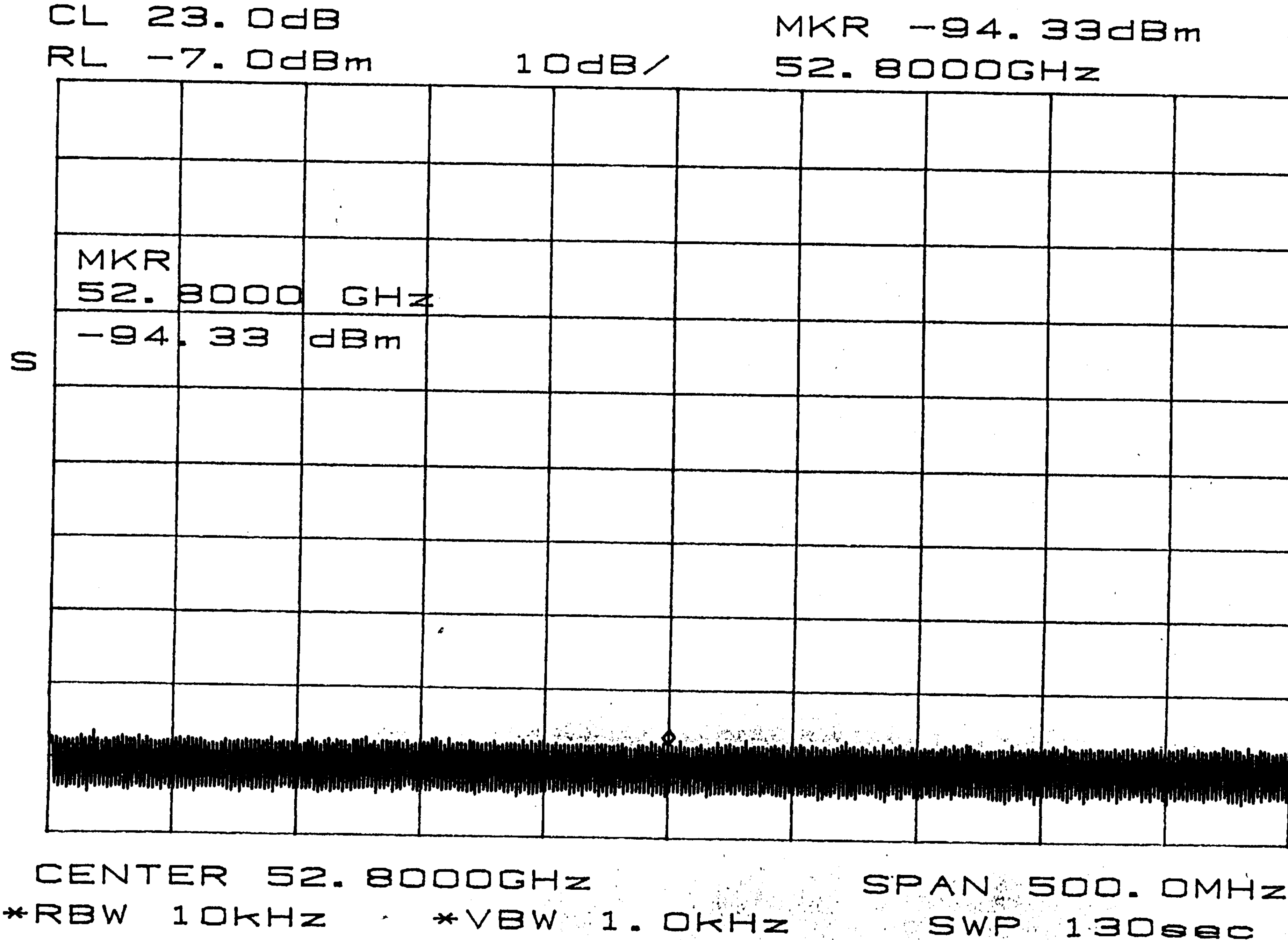


CENTER 50.3000GHz SPAN 500.0MHz
*RBW 10kHz *VBW 1.0kHz SWP 130sec

7-24-98

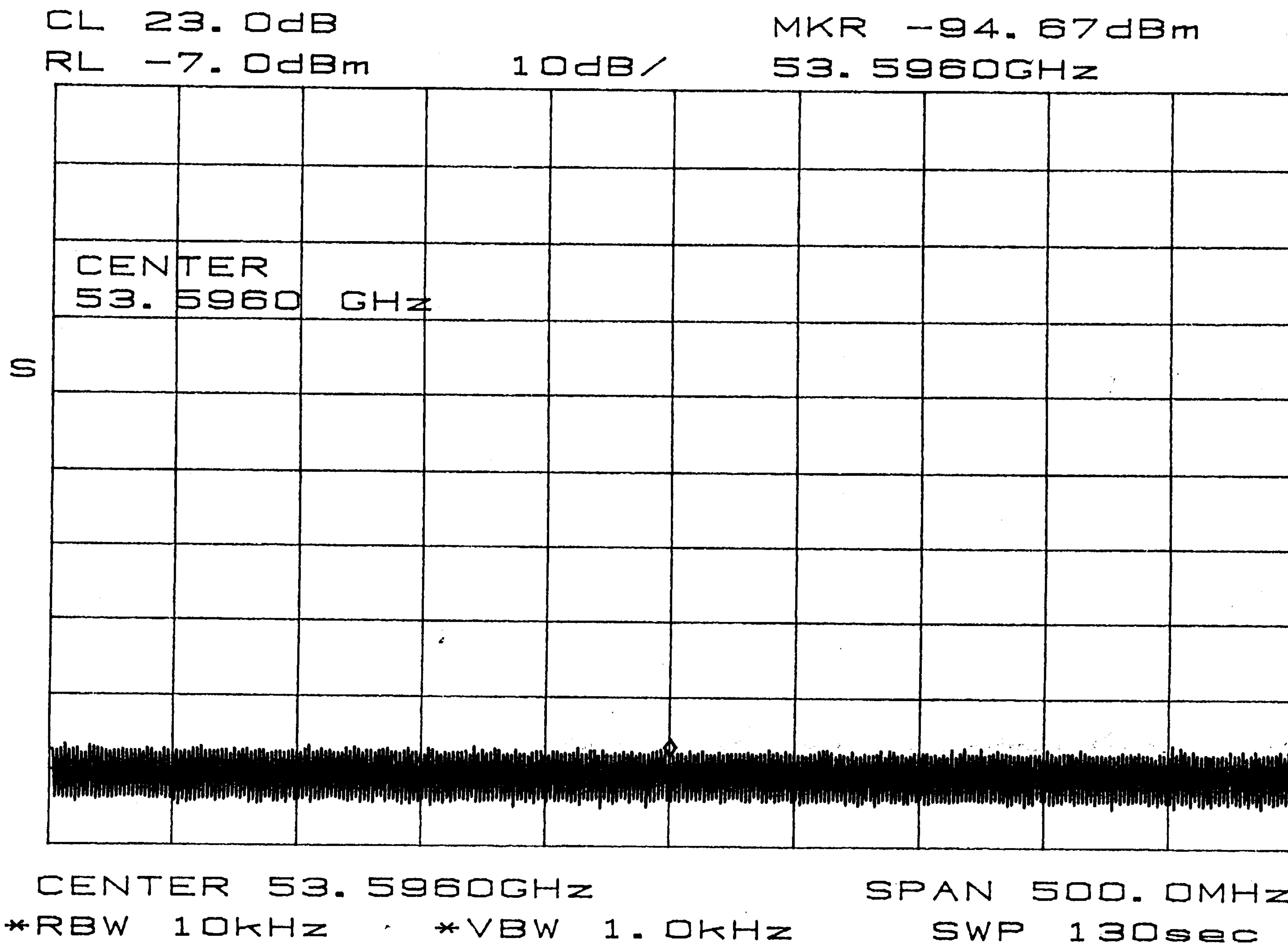
S/N 85023 VN

SPURIOUS



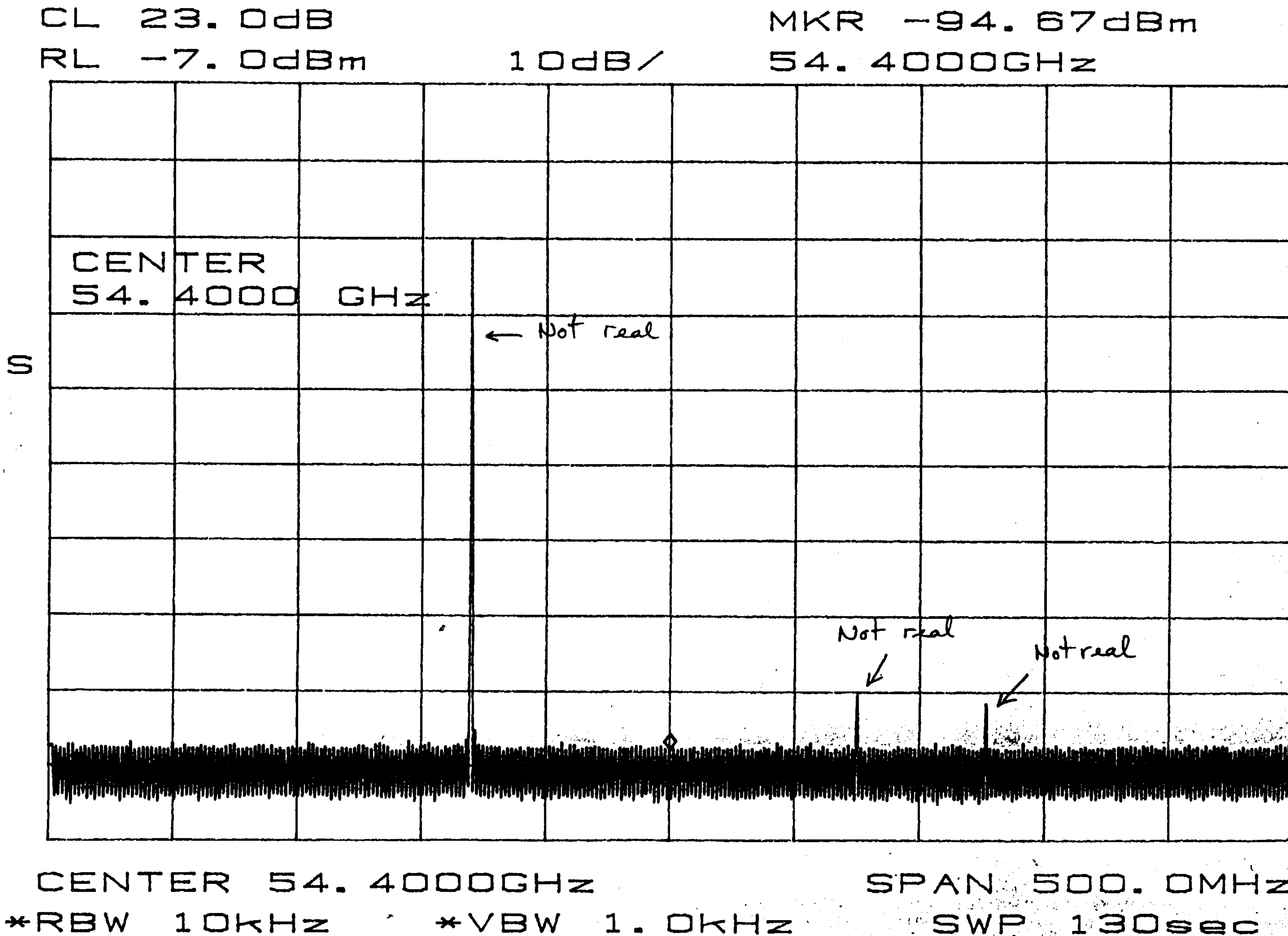
7-24-98
S/N 85023 VN

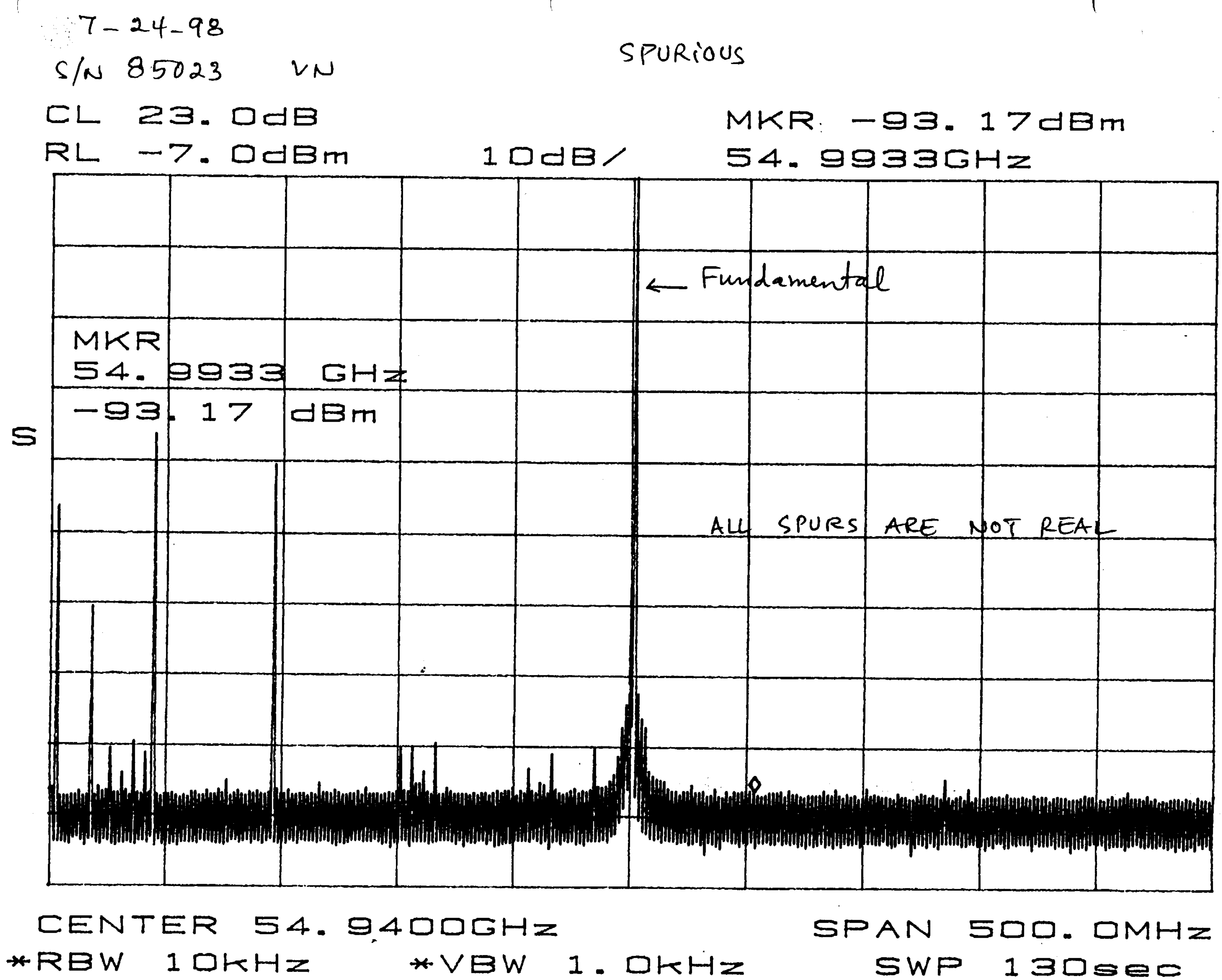
SPURIOUS



7-24-98
S/N 85023 VN

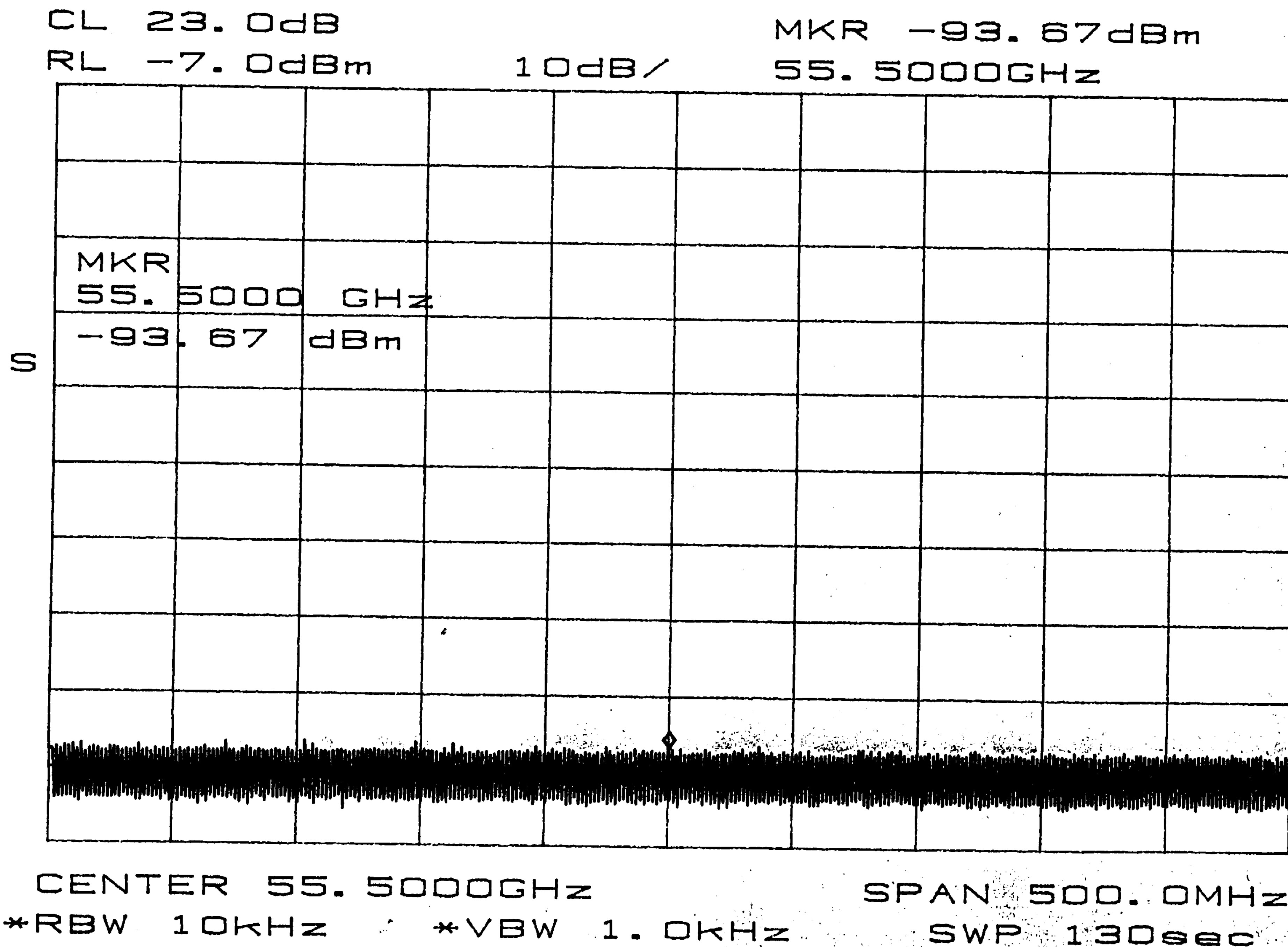
SPURIOUS




7-24-98
S/N 85023 VN
SPURIOUS
CL 23.0dB
RL -7.0dBm
10dB/
MKR -93.17dBm
54.9933GHz
← Fundamental
MKR
54.9933 GHz
-93.17 dBm
S
ALL SPURS ARE NOT REAL
CENTER 54.9400GHz
SPAN 500.0MHz
*RBW 10kHz
*VBW 1.0kHz
SWP 130sec

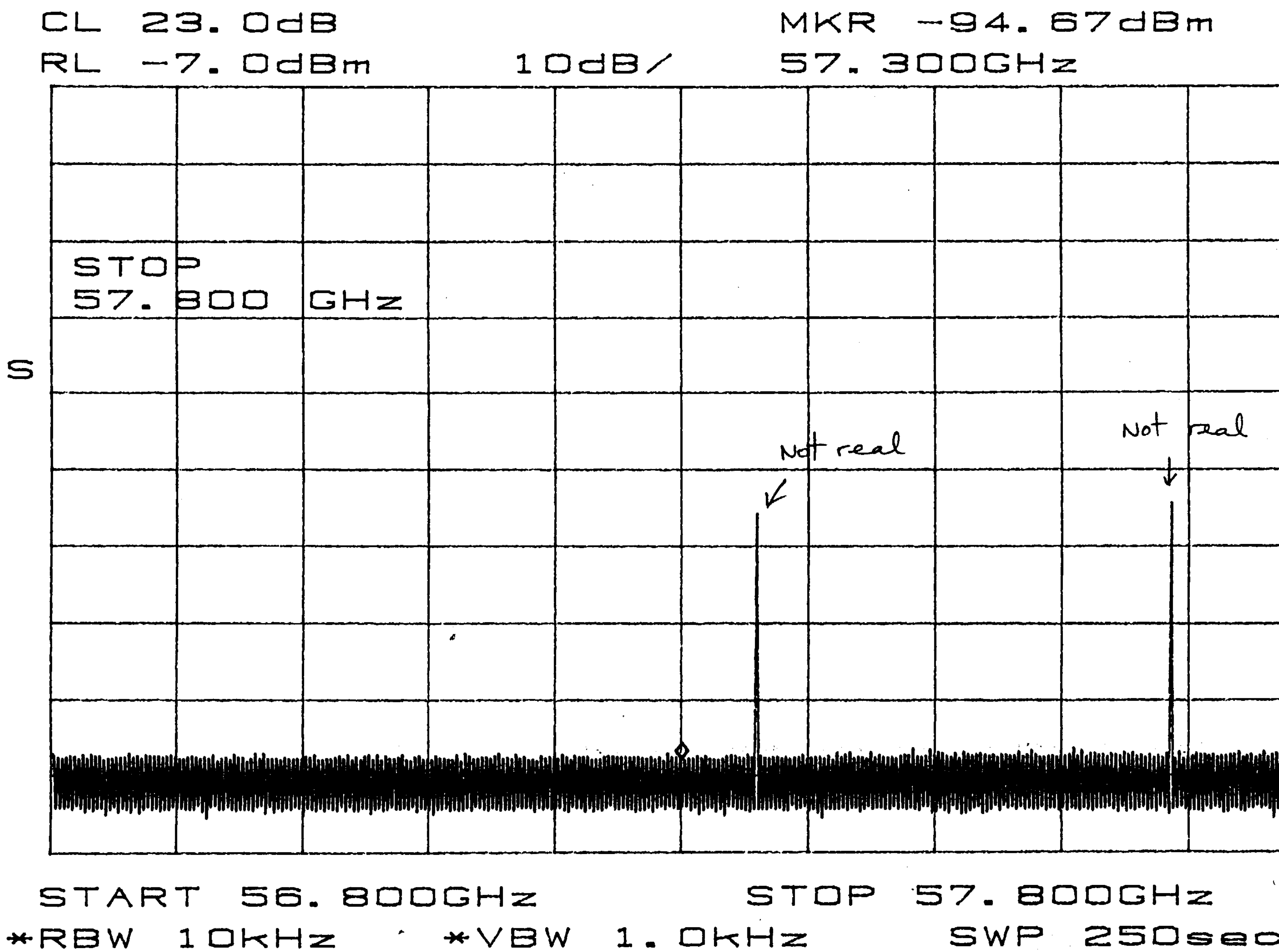
7-24-98
S/N 85023 VN

SPURIOUS



7-24-98
S/N 85023 VN

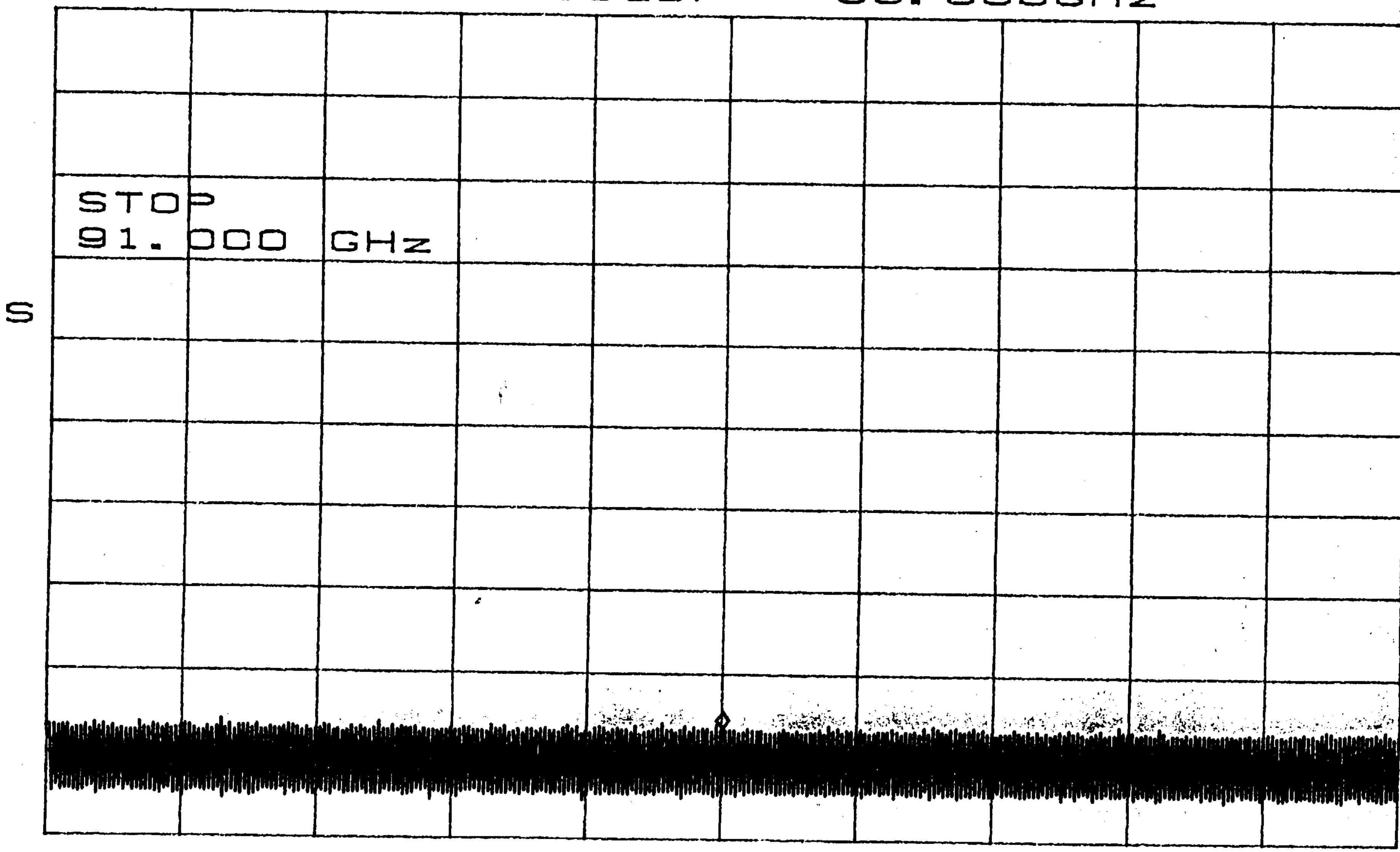
SPURIOUS



7-24-98
S/N 85023 VN

SPURIOUS

CL 40.0dB
RL 10.0dBm 10dB/ MKR -76.50dBm
89.000GHz



START 87.000GHz STOP 91.000GHz
*RBW 10kHz *VBW 1.0kHz SWP 1.0ksec

LITTON
Solid State

TEST DATA SHEET 7.13
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A
AESD 1336610- 7
ACCEPT TEST ✓

FM Noise: Ref. Test Para. 5.6.1

TEST DESCRIPTION			LIMITS
FM noise (Attach plot):			
Temperature		22 °C	Tnom ± 1°C
Measured	=	< -110 dBc/Hz 1 MHz to 40 MHz	-100 dBc/Hz max.
Measured	=	< -135 dBc/Hz 40 MHz to 400 MHz	-100 dBc/Hz max.

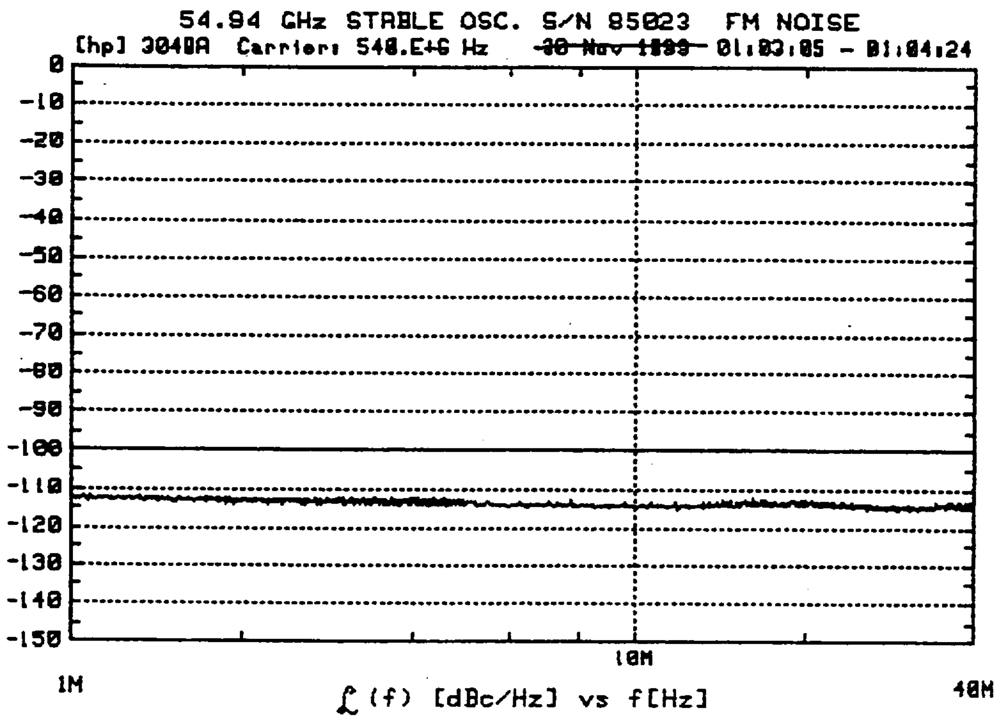
Accept ✓ Reject ______

Test Performed by VN Date 7-24-98

Litton Q.A. LITTON M 60 Date JUL 28 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 49 OF 68
56348	A	1300823	B3	

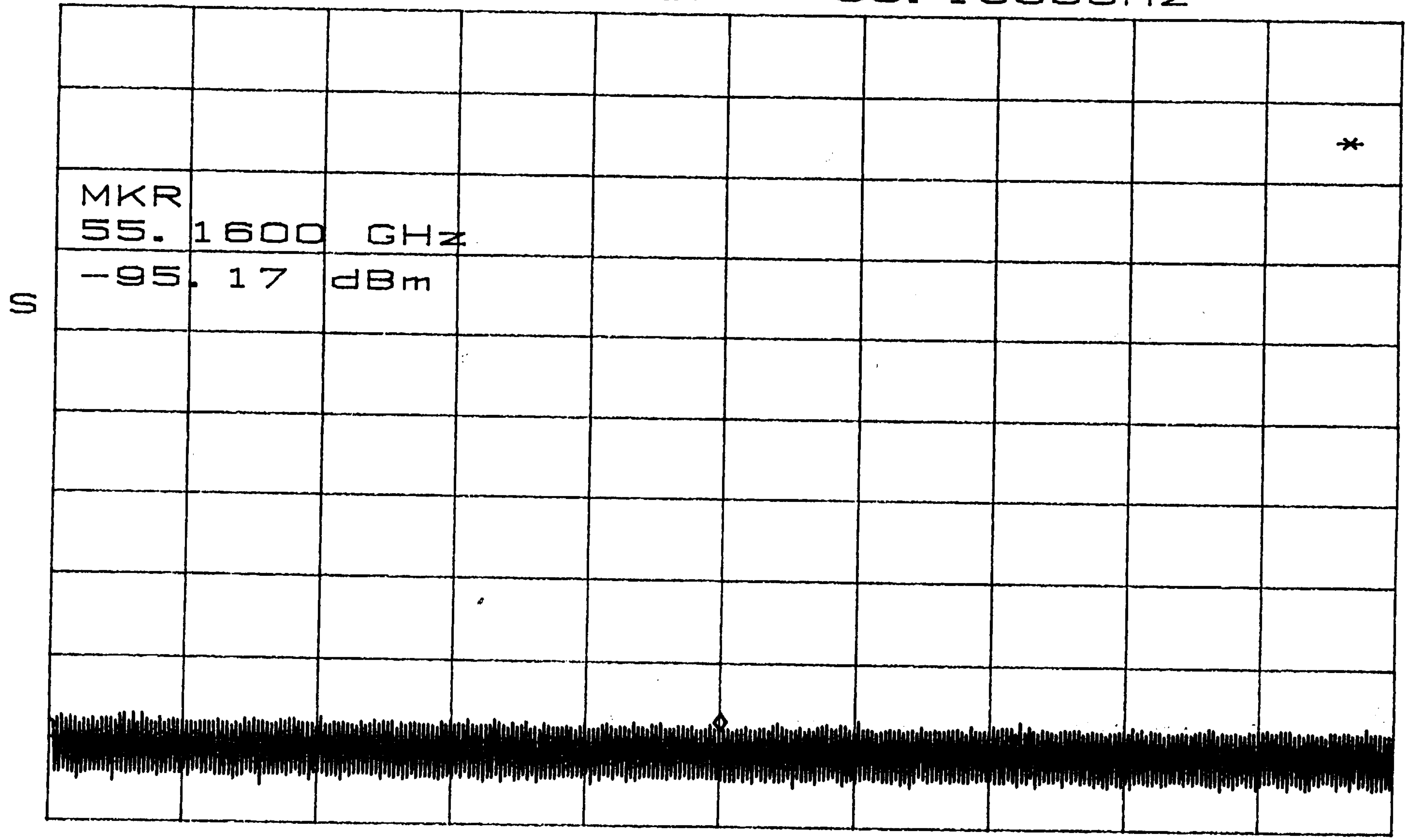
7-24-98
VJ


54.94 GHz STABLE OSC. S/N 85023 FM NOISE
[hp] 3048A Carrier: 548.E+6 Hz ~~30 Nov 1999~~ 01:03:05 - 01:04:24
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
1M
10M
40M
£(f) [dBc/Hz] vs f[Hz]

S/N 85023 VN FM NOISE (From 40 MHz → 400 MHz)

CL 23.0dB
RL −7.0dBm 10dB/

MKR −95.17dBm
55.1600GHz

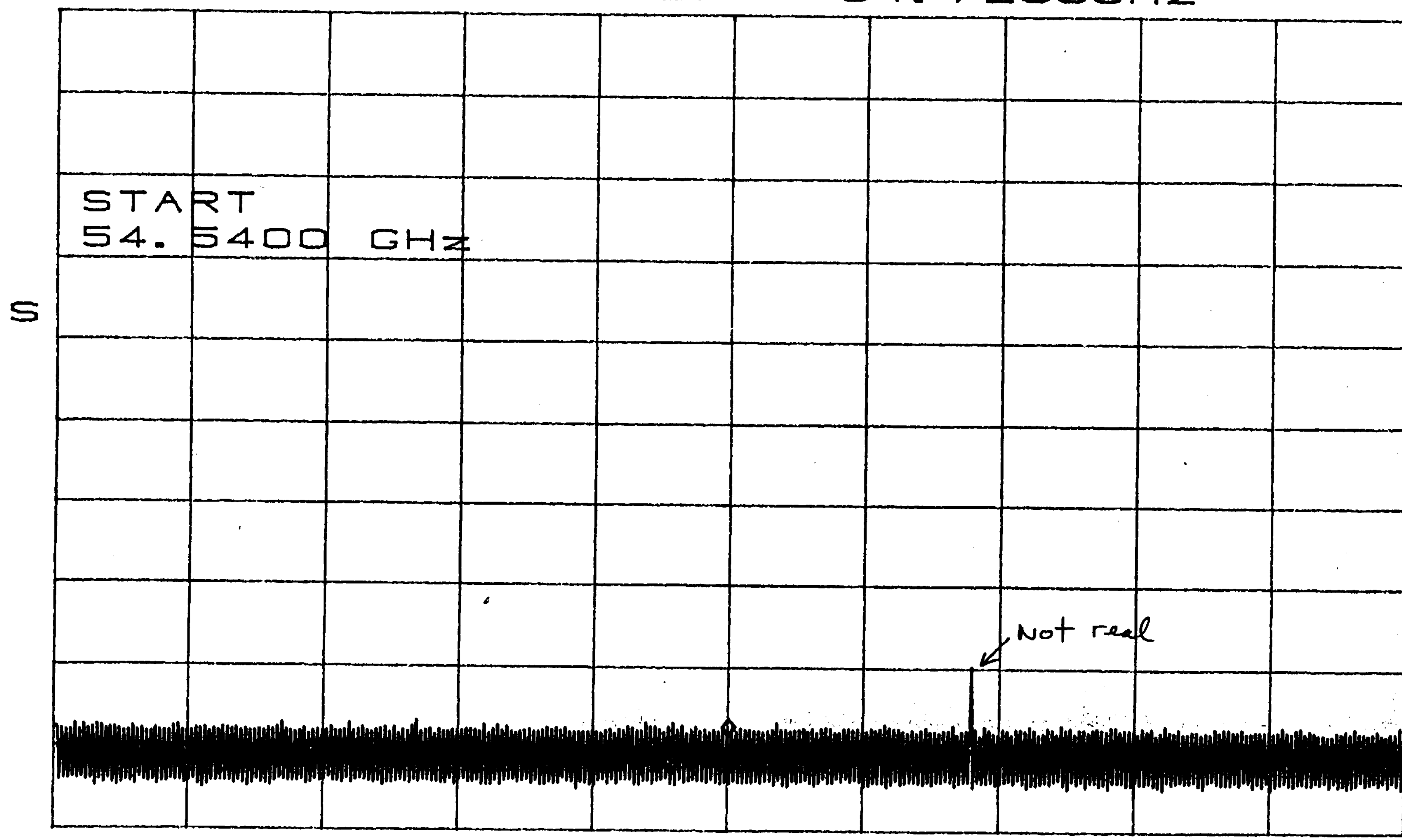


START 54.9800GHz STOP 55.3400GHz
*RBW 10kHz *VBW 1.0kHz SWP 90.0sec

1-24-98
S/N 85023 VN

FM NOISE (From -400 MHz → -40 MHz)

CL 23.0dB
RL -7.0dBm
10dB/
MKR -95.33dBm
54.7200GHz



START 54.5400GHz
STOP 54.9000GHz
*RBW 10kHz
*VBW 1.0kHz
SWP 90.0sec

TEST DATA SHEET 7.16
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A

AESD 1336610- 7
ACCEPT TEST ✓

AM Noise: Ref. Test Para. 5.6.2

TEST DESCRIPTION			LIMITS
AM noise (Attach plot):			
Temperature		22 °C	Tnom ± 1°C
Measured	=	<-137 dBc/Hz 1 kHz to 10 kHz	-135 dBc/Hz max.
Measured	=	<-155 dBc/Hz 10 kHz to 100 kHz	-145 dBc/Hz max.
Measured	=	<-160 dBc/Hz at 100 kHz to 40 MHz	-150 dBc/Hz max.
RF Power Input, Mixer (Nominal), P_{mixer}		7 dBm	0 to 7 dBm
RF Voltage, Termination (Nominal), $V_{carrier}$		0.081 V	
RF Voltage, Termination (attn -.5dB), $V_{-.5dB}$		0.090 V	
RF Voltage, Termination (attn +.5dB), $V_{+.5dB}$		0.075 V	
Calculate mixer carrier power, $P_{carrier} = V^2_{carrier} / 50$: $P_{carrier} =$		-8.8 dBm	
Calculate -.5dB carrier power, $P_{-.5dB} = V^2_{-.5dB} / 50$: $P_{-.5dB} =$		-7.9 dBm	
Calculate +.5dB carrier power, $P_{+.5dB} = V^2_{+.5dB} / 50$: $P_{+.5dB} =$		-9.5 dBm	
Calculate Mixer Transfer Correction Factor, $CF_{mixer} = P_{-.5dB} - P_{+.5dB} - 1$ dB : $CF_{mixer} =$		0.6 dB	
Noise (spectrum analyzer), Lmeas		-104 dB	
Total Gain, LNA, G_{LNA}		64 dB	
Calculate Noise of UUT, $L_f = L_{meas} - P_{carrier} - G_{LNA} - CF_{mixer}$: $L_f =$		-160 dBc/Hz at 40 MHz to 400 MHz	-150 dBc/Hz max

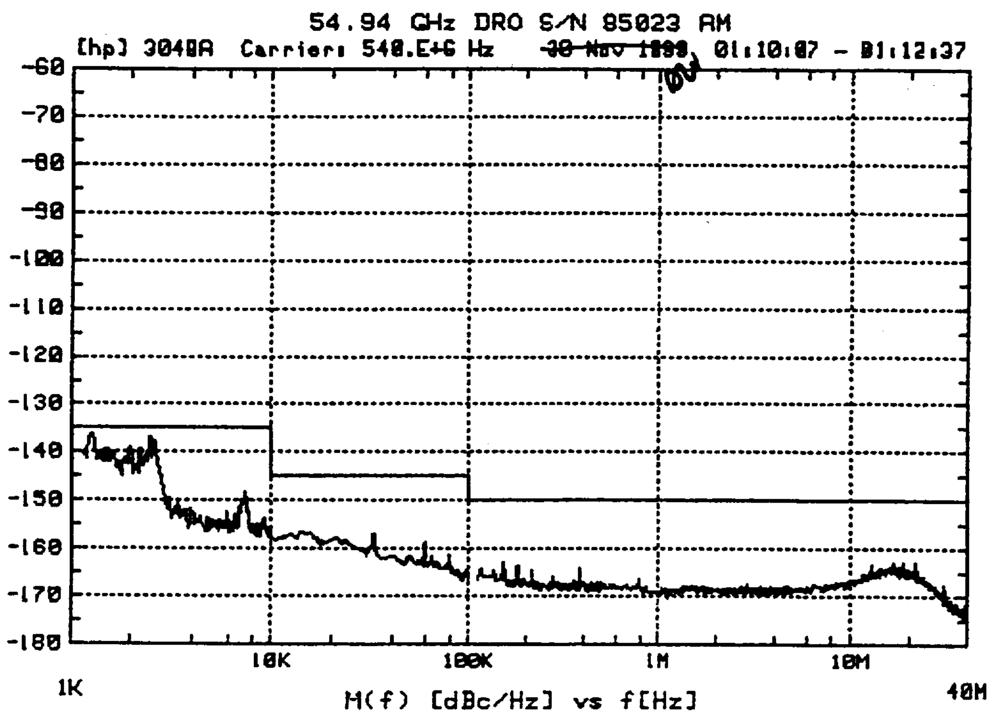
Accept ✓ Reject ______

Test Performed by VN Date 7-24-98

Litton Q.A. LITTON M 60 Date JUL 2 8 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 52 OF 68
56348	A	1300823	B3	

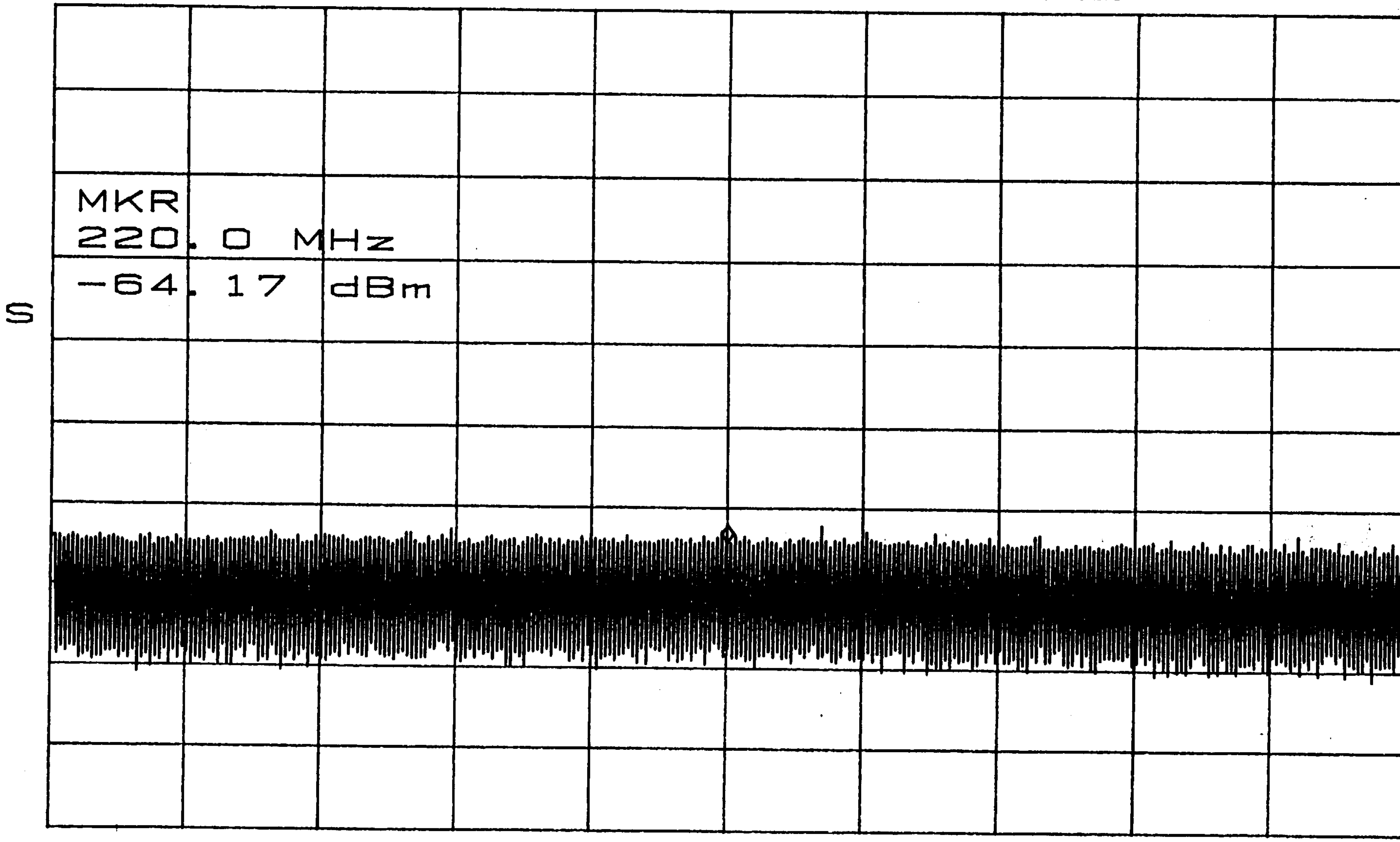
7-24-98
VN



54.94 GHz DRO S/N 85023 AM
[hp] 3048A Carrier: 548.E+6 Hz ~~30 Nov 1899~~ 01:10:07 - 01:12:37
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
1K
10K
100K
1M
10M
40M
M(f) [dBc/Hz] vs f[Hz]

S/N 85023 AM Nois (from 40MHz → 400 MHz)

ATTEN 10dB MKR -64. 17dBm
RL 0dBm 10dB/ 220. 0MHz



START 40. 0MHz STOP 400. 0MHz
*RBW 10kHz *VBW 1. 0kHz SWP 90. 0sec

TEST DATA SHEET 7.19
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A

AESD 1336610- 7
ACCEPT TEST ✓

Harmonics Tests: Ref. Test Para. 5.7

TEST DESCRIPTION		LIMITS
Temperature	22 °C	Tnom ± 1°C
Frequency, per 5.7.1	5494028 GHz	Table IIIB
RF Output Power, per 5.7.1	12.5 dBm	12 to 17 dBm
Harmonics:		
Level of second Harmonic	-77 dBm	
Difference (2nd Harmonic)	-90 dB	-30 dBc min
Subharmonics:		
Level of Subharmonic	-96 dBm	
Difference (Subharmonic)	-108 dB	-90 dBc min

Accept ✓ Reject ______

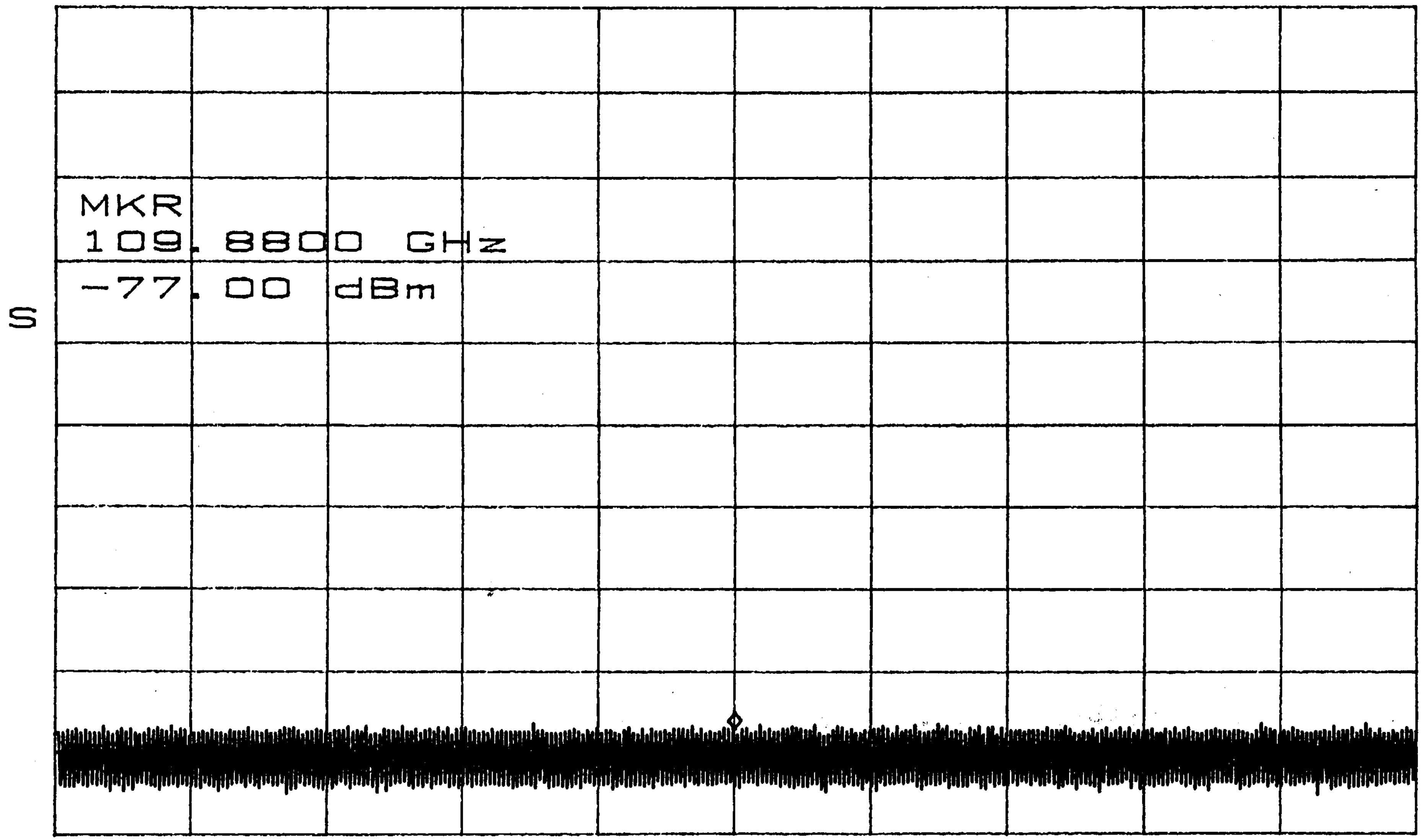
Test Performed by VN Date 7-24-98

Litton Q.A. LITTON M 63 Date JUL 2 8 1998

7-24-98
S/N 85023 VN

2 ND HARMONIC

CL 40.0dB MKR -77.00dBm
RL 10.0dBm 10dB/ 109.8800GHz



CENTER 109.8800GHz SPAN 500.0MHz
*RBW 10kHz *VBW 1.0kHz SWP 130sec

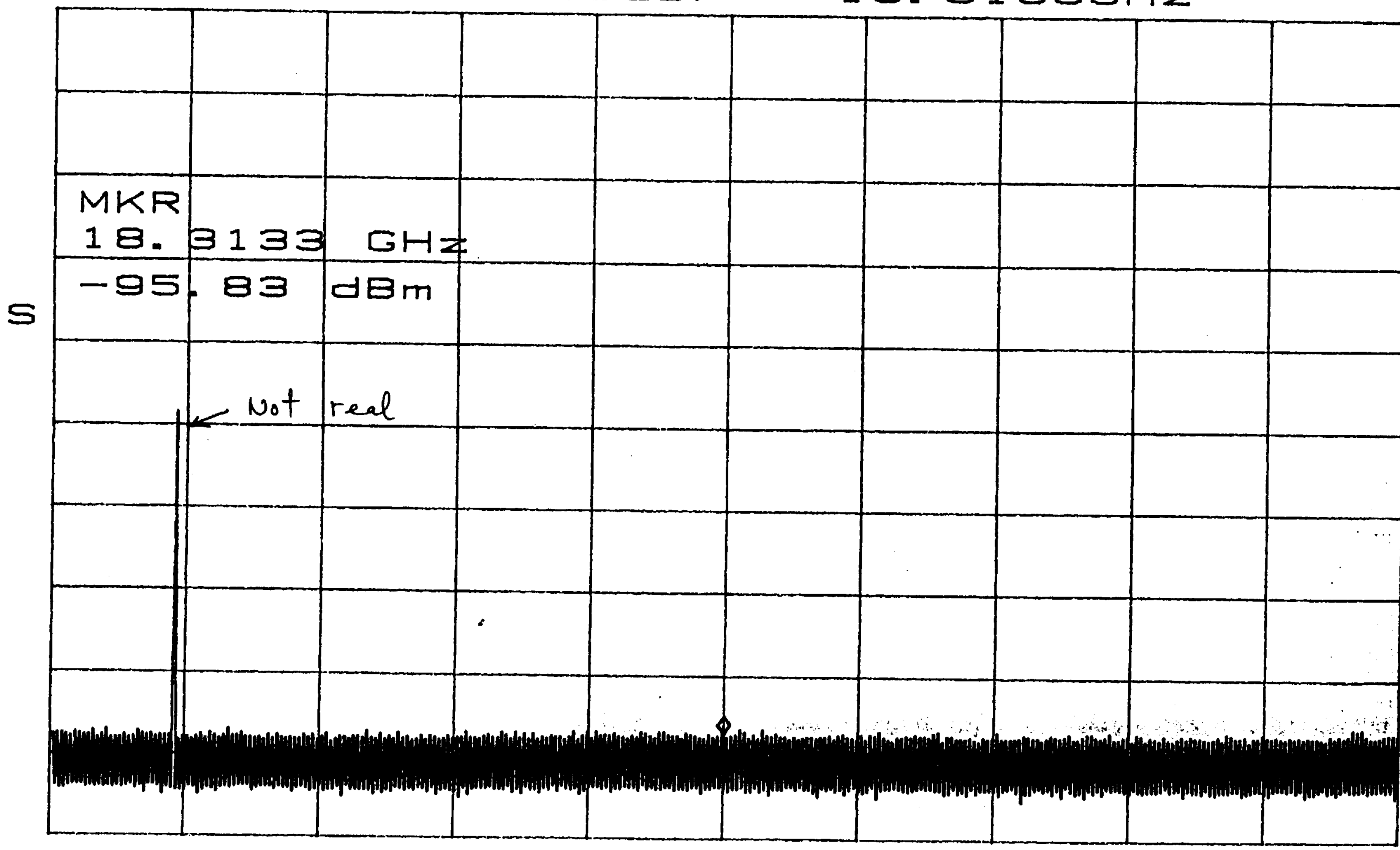
S/N 85023 VN

JB HARMONIC

CL 21.0dB
RL -9.0dBm

10dB/

MKR -95.83dBm
18.3133GHz



CENTER 18.3133GHz
*RBW 10kHz

*VBW 1.0kHz

SPAN 500.0MHz
SWP 130sec

TEST DATA SHEET 7.22A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A
AESD 1336610- 7
ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION		LIMITS
1. Initial Performance at Tnom ± 1°C		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{Tnom}	54.94024 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.5 dBm	12 to 17 dBm
Input Voltage, V_B	10 VDC	10 ± 0.2 VDC
Input Current, I_B	194 mA	Table IIIB
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.24 MHz	
2. Performance at Tnom ± 1°C after +60°C soak.		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{meas}	54.94002 GHz	Table IIIB
RF Output Power, P_{meas}	12.5 dBm	12 to 17 dBm
Input Voltage	10 VDC	V_B ± .005 VDC
Input Current	195 mA	Table IIIB
3. Performance at Tnom ± 1°C after -30°C soak.		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{meas}	54.94030 GHz	Table IIIB
RF Output Power, P_{meas}	12.5 dBm	12 to 17 dBm
Input Voltage	10 VDC	V_B ± .005 VDC
Input Current	193 mA	Table IIIB

Calculate frequency variation, $\Delta f_H = f_{meas} - f_{Tnom}$:
Δf_H after 60°C soak = −0.22 MHz
Δf_H after -30°C soak = 0.06 MHz

Calculate RF output power variation, $\Delta P_H = P_{meas} - P_{Tnom}$:
ΔP_H = after 60°C soak = ∅ dB
ΔP_H = after -30°C soak = ∅ dB

Accept ✓ Reject ______
Test Performed by VN Date 7-22-98
Litton Q.A. Date JUL 28 1998

LITTON M 69

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 58 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.22B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AJ/A
SERIAL NUMBER: 85023 QUAL TEST N/A

AESD 1336610- 7
ACCEPT TEST ✓

Frequency and Power Hysteresis: Ref Test Para. 5.8

TEST DESCRIPTION		LIMITS
4. Performance at Tnom ± 1°C at Ambient Pressure		
Temperature	22 °C	Tnom ± 1°C
Frequency, f_{meas}	54.94038 GHz	Table IIIB
RF Output Power, P_{meas}	12.7 dBm	12 to 17 dBm
Input Voltage, V_B	10 VDC	V_B ± .0005 VDC
Input Current	193 mA	Table IIIB

Calculate frequency variation, $\Delta f_P = f_{meas} - f_{Tnom}$:

$\Delta f_P =$ 0.14 MHz

Calculate RF output power variation, $\Delta P_p = P_{meas} - P_{Tnom}$:

$\Delta P_p =$ 0.2 dB

Accept ✓ Reject ______

Test Performed by VN Date 7-24-98

Litton Q.A. LITTON 60 Date JUL 28 1998

LITTON
Solid State

TEST DATA SHEET 7.23A
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AJ/A AESD 1336610- 7
SERIAL NUMBER: 85023 QUAL TEST N/A ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Initial Measurement. Ref Test Par. 5.9.1			
Temperature	22	°C	24°C ± 5°C
Frequency	54.94037	GHz	Table IIIB
RF Output Power	12.7	dBm	12 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current	194	mA	Table IIIB
Reference test. Ref. Test Para. 5.9.3			
Frequency, f_{Ref}	54.94036	GHz	Table IIIB
RF Output Power, P_{Ref}	-30	dBm	
Load Pulling Test. Ref. Test Para. 5.9.4			
Maximum Frequency, f_{meas}	54.94037	GHz	Table IIIB
Minimum Frequency, f_{meas}	54.94035	GHz	Table IIIB
Maximum RF Output Power P_{meas}	-2.8	dBm	
Minimum RF Output Power, P_{meas}	-3.3	dBm	

Calculate maximum positive (f_{meas} is greater than f_{Ref}) and negative (f_{meas} is less than f_{Ref}) frequency variation, $\Delta f_L = f_{meas} - f_{Ref}$.

Maximum Positive Δf_L = 0.01 MHz
Maximum Negative Δf_L = -0.01 MHz

Calculate maximum positive (P_{meas} is greater than P_{Ref}) and negative (P_{meas} is less than P_{Ref}) RF Output Power Variation, $\Delta P_L = P_{meas} - P_{Ref}$.

Maximum Positive ΔP_L = 0.2 dB
Maximum Negative ΔP_L = -0.3 dB

Accept ✓ Reject ______

Test Performed by VN Date 7-24-98
Litton Q.A. 00 W NOLET Date JUL 28 1998

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AJ/A — AESD 1336610- 7
SERIAL NUMBER: 85023 — QUAL TEST N/A — ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	22	°C	24°C ± 5°C
Frequency:	5494037	GHz	Table IIIB
RF Output Power:	12.7	dBm	12 to 17 dBm
Input Voltage	10	VDC	10 ± 0.2 VDC
Input Current:	194	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	0.39	MHz (Positive)	Table IIIB
	−0.23	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	0.25	MHz (Positive)	Table IIIB
	−0.18	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0.4	dB (Positive)	1.0 dB
	−0.7	dB (Negative)	-1.0 dB

Accept ✓ Reject ______

Test Performed by VN Date 7-24-98

Litton Q.A. [stamp: LITTON 60 14] Date JUL 28 1998

Channel 7 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-17, S/N: 7A67)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.50	0.50	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	70.82	1.63	2.0	QA 1	
10.00	70.88				
10.04	70.69				

ΔG_v = 0.13 dB

		DATE	ACC	REJ
PART NO. 1331562-170	SPACEK QA	10-28-98	QA 1	
SER NO. 7A67	TEST FAILURE:			
TESTED BY: ZZK	FAILURE ANALYSIS NO.			
END DATE: 6-5-98				
END TIME: 1600				

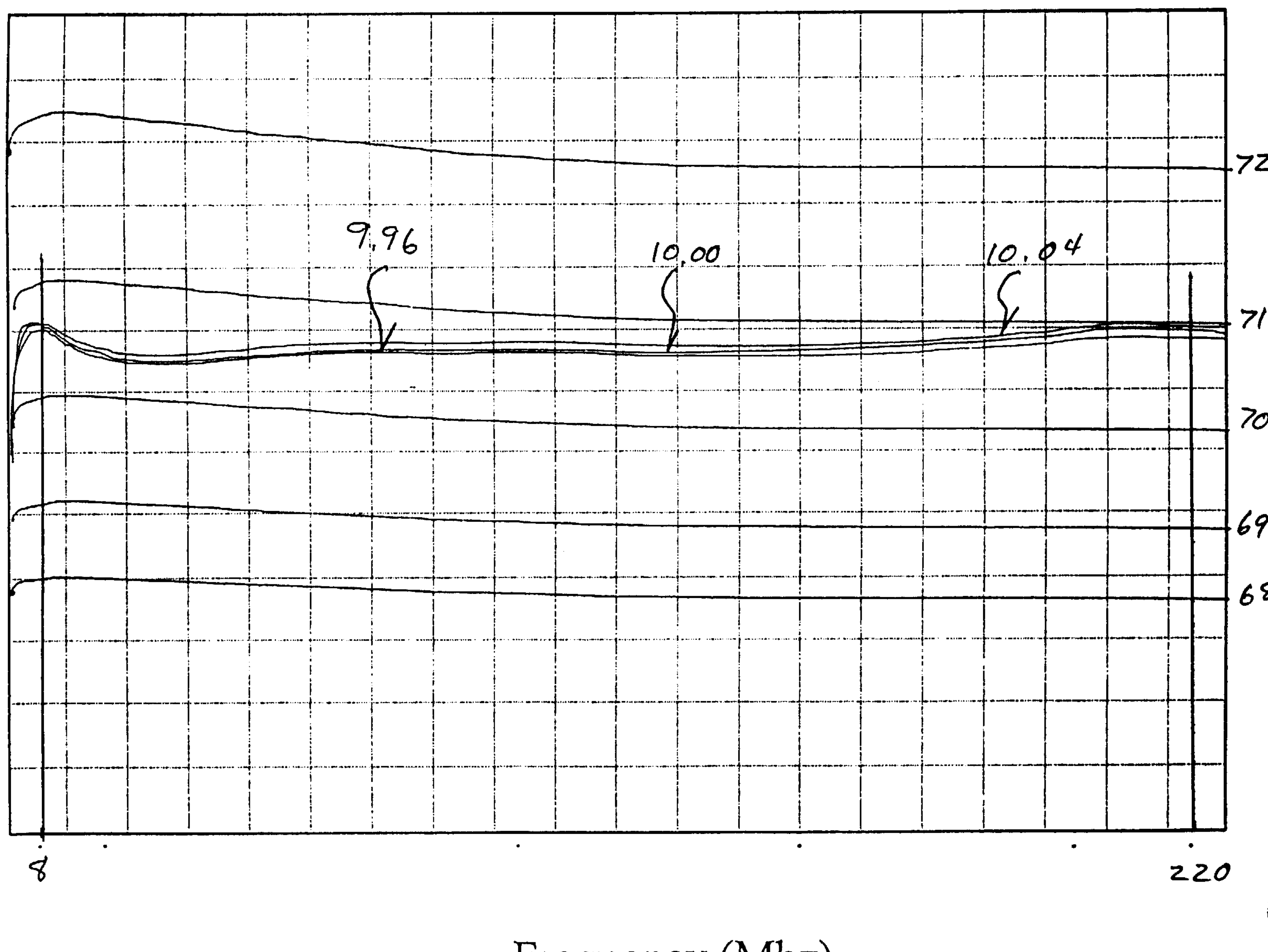
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-176
Serial No. 7A67
Date 6-6-98
Tested By 777

Amb Temp 23°C



QA 1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 -6	G_{T1} 71.65				
		* 0.018	0.035dB/°C	QA 1	
T2 +8	G_{T2} 71.40				
		* 0.023	0.020dB/°C		QA 1
T3 +28	G_{T3} 70.94				
		* 0.030	0.035dB/°C	QA 1	
T4 +40	G_{T4} 70.58				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \qquad i = 1,2,3,4$$

ΔG_T = 1.07 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 1.6 dB Spec 1.4dB ACC____ REJ QA 1

	DATE	ACC	REJ
SPACEK QA	10-28-98		QA 1

ENGINEERING DATA ONLY. SEE AE248691 PARA. 3.2.1.15.1 acceptable

PART NO. 1331562-17F

SER NO. 7A67

TESTED BY: 77H

END DATE: 6-5-98

END TIME: 1600

TEST FAILURE: ____________

FAILURE ANALYSIS NO. ____________

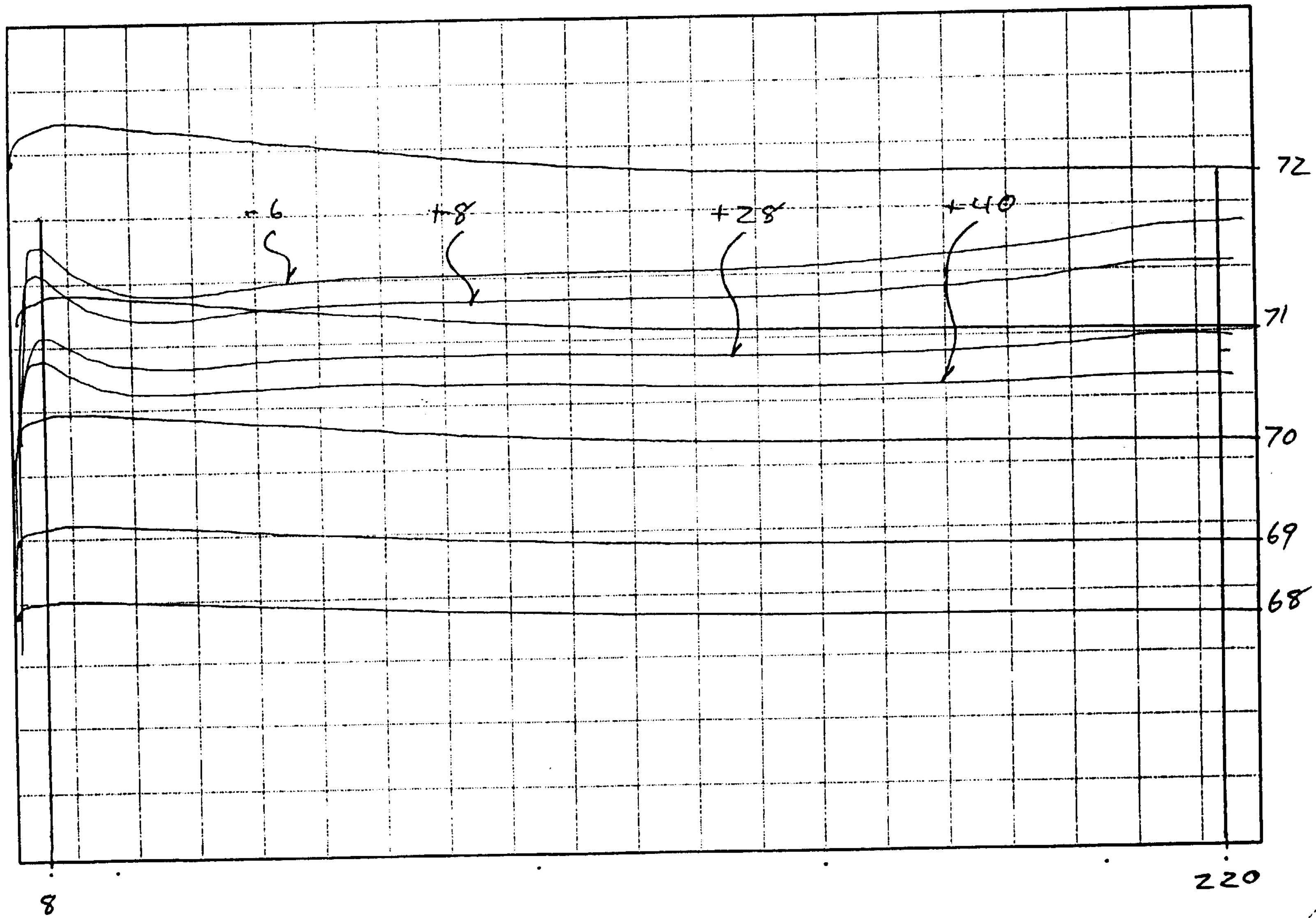
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No.	1331562-176
Serial No.	7A67
Date	6-6-98
Tested By	[illegible]

Amb Temp 23°C



TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.3	0.7	1.0	QA 1	
				X						20					
	X	X								50					
X	X	X	X	X	X	X	X			100	-2.4	0.6	1.0	QA 1	
X										150					
			X	X	X	X	X	X		200	-2.4	0.6	1.0	QA 1	
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-20.5	-24.1	3.6	1.19

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

PART NO. 1331562- 17G

SPACEK QA — DATE: 10-28-98 — ACC: QA 1 — REJ:

SER NO. 7A67

TEST FAILURE:

TESTED BY: 777

FAILURE ANALYSIS NO.

END DATE: 6-5-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 12. MIXER-AMPLIFIER ASSEMBLY TESTS

RF PORT RETURN LOSS TEST: ATP PARAGRAPH 5.4.6.

RF FREQ (GHZ)	TOTAL REFLECTED POWER (dBm)	UUT REFLECTED POWER (dBm)	RF RETURN LOSS (dB)	SPEC. RF RETURN LOSS (dB)	ACC	REJ
54.72	-4.8	-19.3	14.5	~~14.0~~ 11.73	QA 1	—
54.94	-4.8	-19.6	14.8	~~14.0~~ 11.73	QA 1	—
55.16	-4.7	-19.5	14.8	~~14.0~~ 11.73		—

AVERAGE NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.4.7.

DATE: 11-20-98 AMBIENT ROOM TEMPERATURE °C: +21

	TOTAL POWER @ AMBIENT (dBm)	TOTAL POWER @ 77.2 DEG K (dBm)	Y FACTOR (dB)	DSB NOISE FIGURE (dB)	SPEC. DSB NOISE FIGURE (dB)	ACC	REJ
LO power level at ~~±8.5dBm~~(with ripple) +7.0dBm							
1ST	-20.00	-21.90	1.90	3.3	3.8		
2ND	-20.00	-21.90	1.90	3.3	3.8		
3RD	-20.00	-21.90	1.90	3.3	3.8		
AVG	-20.00	-21.90	1.90	3.3	3.8	QA 1	—
LO power level at ~~±10dBm~~(with ripple) +8.5dBm							
1ST	-19.80	-21.70	1.90	3.3	3.8		
2ND	-19.80	-21.70	1.90	3.3	3.8		
3RD	-19.80	-21.70	1.90	3.3	3.8		
AVG	-19.80	-21.70	1.90	3.3	3.8	QA 1	—
LO power level at ~~±11.5dBm~~(with ripple) +10.0dBm							
1ST	-19.50	-21.40	1.90	3.3	3.8		
2ND	-19.50	-21.40	1.90	3.3	3.8		
3RD	-19.50	-21.40	1.90	3.3	3.8		
AVG	-19.50	-21.40	1.90	3.3	3.8	QA 1	—

NOTE: *Above data was taken with the Daden filte, except on the -19 unit.*

PART NO. 1331562-17F

SPACEK QA — DATE 11-23-98 — ACC QA 1 — REJ

SER NO. 7A67

TEST FAILURE:

TESTED BY: [signature]

FAILURE ANALYSIS NO.

END DATE: 11-20-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 11-19-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.3	-19.30	-21.25	1.95	3.2	3.8	QA 1	
+8	43.4	-19.60	-21.50	1.90	3.3	3.8	QA 1	
+28	43.5	-19.90	-21.80	1.90	3.2	3.8	QA 1	
+40	43.6	-20.10	-22.00	1.90	3.3	3.8	QA 1	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NE∆T-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 11-24-98 Ambient Room Temperature °C: 25

Attach computer generated *NE∆T* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.047

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ

			DATE	ACC	REJ
PART NO. 1331562-17F		SPACEK QA	11-25-98	QA 1	
SER NO. 7A67		TEST FAILURE:			
TESTED BY: 777		FAILURE ANALYSIS NO.			
END DATE: 11-25-98					
END TIME: 1600					

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 6-24-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.3	-18.70	-20.4	1.70	3.6	3.8	QA 1	
+8	43.4	-19.00	-20.70	1.70	3.6	3.8	QA 1	
+28	43.5	-19.20	-20.90	1.70	3.6	3.8	QA 1	
+40	43.6	-19.40	-21.05	1.65	3.7	3.8	QA 1	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ______

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 6-22-98 Ambient Room Temperature °C: 24

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.040

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ ______

PART NO. 1331562-18E

SPACEK QA DATE 6-29-98 ACC QA 1 REJ ____

SER NO. 7A38

TEST FAILURE: __________

TESTED BY: [signature]

FAILURE ANALYSIS NO. __________

END DATE: 6-26-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

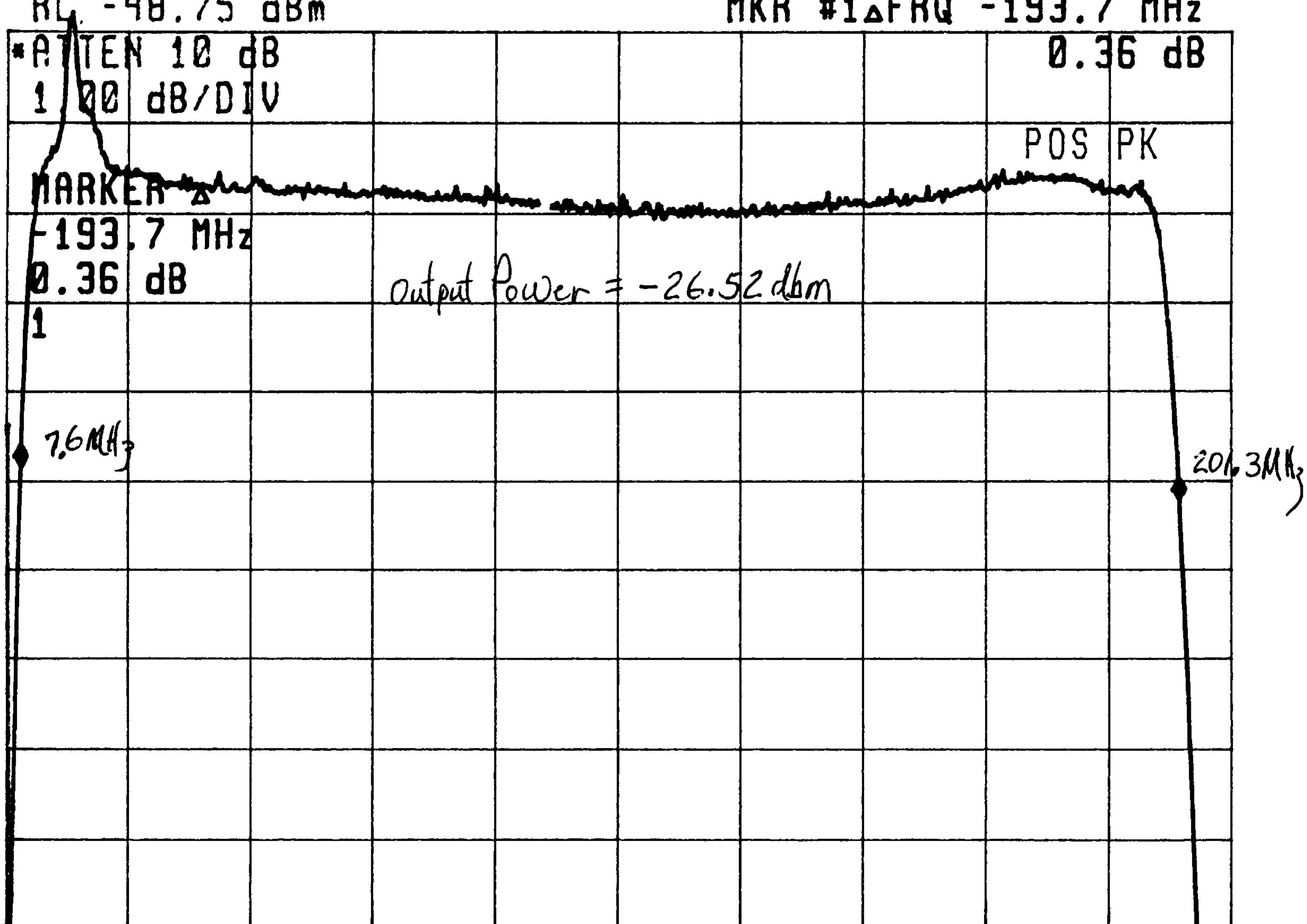
TEST DATA

FOR

CHANNEL 7

11:10:53 MAY 12, 2000

RL -48.75 dBm MKR #1ΔFRQ -193.7 MHz



START 5.00 MHz CH7 REWORK STOP 210.0 MHz

*RB 1.00 MHz *VB 300 Hz *ST 5.200 sec

S/O: 822739 OP: 00800
STEP: C

CH7 "NO MESH"
ENG EVAL

TEST ENG:
Date: 5-12-00
5/18/00

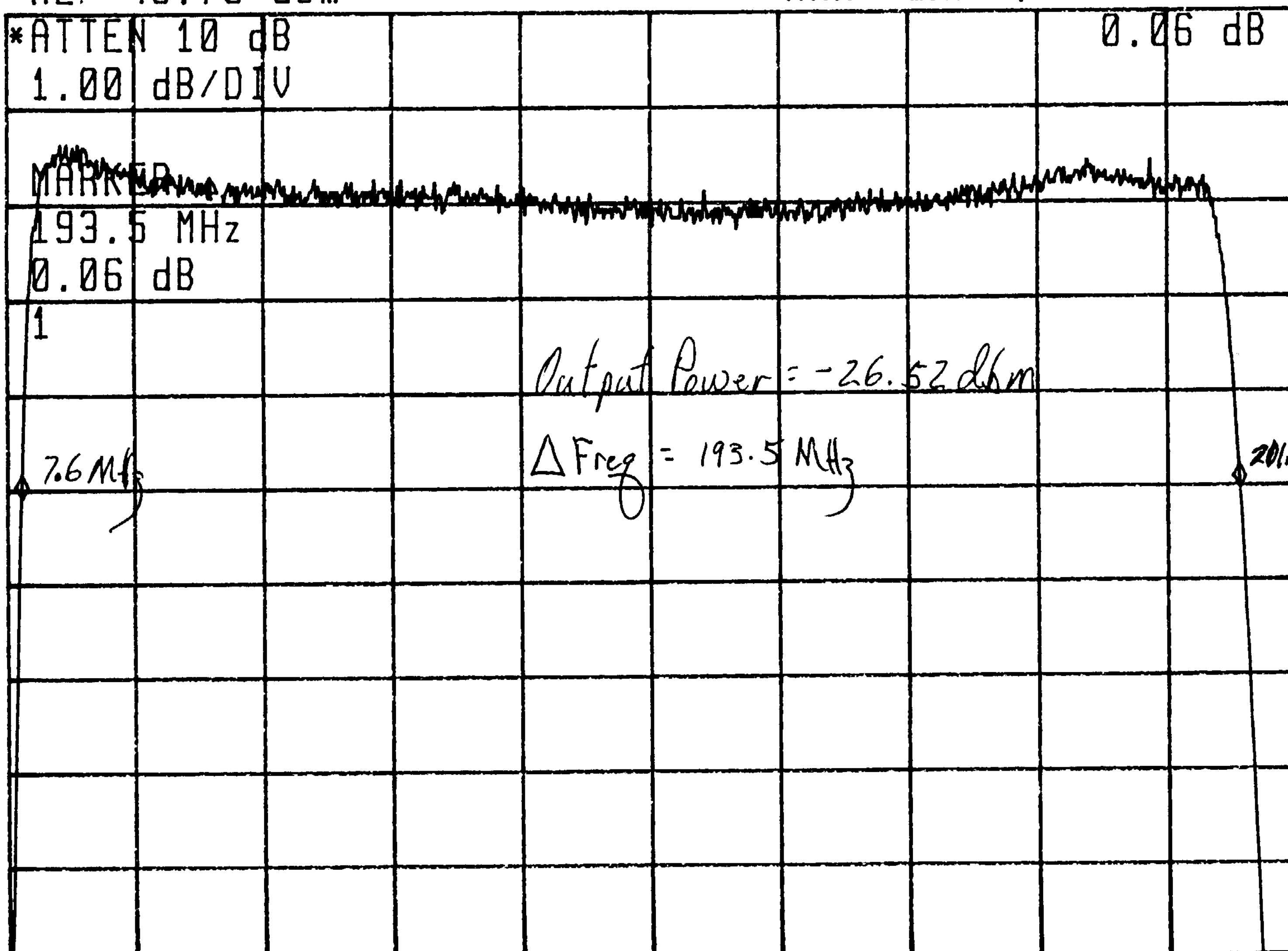
P/N: 1331720-3
SN: 109

12:29:29 MAY 12, 2000

RL -48.75 dBm

MKR #1ΔFRQ 193.5 MHz

0.06 dB



START 5.00 MHz CH7 REWORK STOP 210.0 MHz

*RB 1.00 MHz *VB 300 Hz *ST 5.200 sec

CH7 "WITH MESH"

ENG EVAL

P/N: 133720-3

S/N: 109

S/O: 822739

OP: 0080

Step: C

TEST ENG: [signature]

Date: 5-12-00

Anita Navarro 5/12/00

Channel 7 Rework
S/O 822739 Oper. 00800/C Step

TEST DATA SHEET NO. 53
Receiver Subsystem IF 3dB Bandwidth Measurements (Paragraph 3.3.8.1)

Output	Description	(+) Pin	(-) Pin	Measured Voltage	Required Voltage	Pass/ Fail
7	+15V	J805-7	J805-6	N/A	14.8 to 15.2	N/A
8	-15V	J805-8	J805-6		-14.8 to -15.2	
9	+8V	J805-10	J805-9		7.9 to 8.1	
10	+10V	J803-1	J803-2		9.9 to 10.1	
11	+10V	J805-1	J805-2		9.9 to 10.1	
12	+10V	J803-6	J803-5		9.9 to 10.1	
13	+10V	J803-8	J803-7		9.9 to 10.1	
14	+10V	J804-1	J804-2		9.9 to 10.1	
15	+10V	J804-5	J804-4		9.9 to 10.1	
16	+10V	J805-13	J805-12		9.9 to 10.1	
17	+10V	J805-15	J805-14		9.9 to 10.1	
18	+15V	J805-17	J805-16	N/A	14.8 to 15.2	N/A

Step	Output	Measured Voltage(volts)	Required Voltage(volts)	Measured Current(mA)	Required Current(mA)	Pass/ Fail
21	+28V (Main)	N/A	26 to 30	N/A	<3000	N/A
21	+28V (Pulse)	N/A	26 to 30	N/A	<200	N/A

Channel	Measured Lower Band (MHz)	Filter Lower Band (MHz)*	Measured Upper Band (MHz)	Filter Upper Band (MHz)*	Measured Bandwidth (MHz)	Bandwidth Requirement (MHz)	Bandwidth Pass/Fail**
3	N/A	8-10	N/A	88-90	N/A	≤ 90	N/A
4		8-10		198-200		≤ 200	
5		30-32		198-200		≤ 170	
6	N/A	8-10	N/A	198-200	N/A	≤ 200	N/A
7	7.6 MHz	8-10	201.3 MHz	198-200	193.5	≤ 200	PASS
8	N/A	8-10	N/A	163-165	N/A	≤ 165	N/A
9		8-10		163-165		≤ 165	
10		178-180		254-256		≤ 78	
11 lower		255.3-258.1		290.3-293.1		≤ 36	
11 upper		351.3-354.1		386.3-389.1		≤ 36	
12 lower		291.3-293.6		306.8-309.1		≤ 16	
12 upper		335.3-337.6		350.8-353.1		≤ 16	
13 lower		308-308.5		315.9-316.4		≤ 8	
13 upper		328-328.5		335.9-336.4		≤ 8	
14 lower		316-316.5		318.9-319.4		≤ 3	
14 upper		325-325.5		327.9-328.4		≤ 3	
15	N/A	480-500	N/A	1480-1500	N/A	≤ 1020	N/A

* Filter data from AE-24687 and AE-24937 and is for reference only

** P = Pass, F = Fail

NOTE: Spectrum analyzer plots must be attached to this data sheet

[signature] 5-12-00
Test Systems Engineer — Date

[signature] 5/12/00
Quality Control — Date

Channel 7 Rework
S/O 822739 / Step C

TEST DATA SHEET NO. 54
Receiver Subsystem IF Output Power Measurements (Paragraph 3.3.8.2)

Channel	Measured IF Output (dBm)	Required IF Output (dBm)	Pass/Fail
3	N/A	-27 ± 1	N/A
4		-27 ± 1	
5		-27 ± 1	
6	N/A	-27 ± 1	N/A
7	-26.52	-27 ± 1	PASS
8	N/A	-27 ± 1	N/A
9		-27 ± 1	
10		-27 ± 1	
11		-27 ± 1	
12		-27 ± 1	
13		-27 ± 1	
14		-27 ± 1	
15	N/A	-27 ± 1	N/A

*P = Pass, F = Fail

[signature] 5/12/00
Test Systems Engineer Date

[signature] 5/12/00
Quality Control Date

AMSU A1-33 A1.EXE FULL SCAN MODE P1 12-MAY-00 10:39:16 SCAN NUMBER 69

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

COMMANDS

[9]	MODULE POWER = CONNECT	ANTENNA IN COLD CAL POSIT = NO	[15]
[10]	SURVIVAL HEATER POWER = OFF	ANTENNA IN NADIR POSITION = NO	[16]
[11]	MODULE TOTALLY OFF = ON	ANTENNA IN FULL SCAN MODE = YES	[17]
[12]	SCANNER A1 - 1 POWER = ON	PLL POWER = PLLO # 1	[18]
[13]	SCANNER A1 - 2 POWER = ON	COLD CAL POSITION MSB = ZERO	[19]
[14]	ANTENNA IN WARM CAL POSIT = NO	COLD CAL POSITION LSB = ZERO	[20]

POWER [4] ON

SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 3

"FULL PRINT"

S/O: 822739

OP: 0080 STEP: C

PN: 1331720-3

SN: 109

FULL SCAN MODE

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
1	SYNC SEQUENCE BYTE 1	11111111	572	SCENE DATA BP 17 CH 8	15228
2	SYNC SEQUENCE BYTE 2	11111111	574	CH 9	16517
3	SYNC SEQUENCE BYTE 3	11111111	576	CH 10	16243
4	UNIT ID AND SERIAL NO	00100001	578	CH 11	19302
5	DIGITAL B DATA BYTE 1	00000010	580	CH 12	19149
6	DIGITAL B DATA BYTE 2	00001110	582	CH 13	22963
7	DIGITAL B DATA BYTE 3	00000000	584	CH 14	20478
8	DIGITAL B DATA BYTE 4	00000000	586	CH 15	15135
10	REFLECTOR 1 POSITION 1	23	588	REFLECTOR 1 POSITION 18	2597
12	REFLECTOR 2 POSITION 1	16225	590	REFLECTOR 2 POSITION 18	2418
14	REFL 1 POS 1 2ND LOOK	23	592	REFL 1 POS 18 2ND LOOK	2601
16	REFL 2 POS 1 2ND LOOK	16225	594	REFL 2 POS 18 2ND LOOK	2420
18	SCENE DATA BP 1 CH 3	16604	596	SCENE DATA BP 18 CH 3	16579
20	CH 4	16588	598	CH 4	16583
22	CH 5	16966	600	CH 5	16958
24	CH 6	16947	602	CH 6	16954
26	CH 7	16559	604	CH 7	16586
28	CH 8	15213	606	CH 8	15208
30	CH 9	16507	608	CH 9	16514
32	CH 10	16253	610	CH 10	16253
34	CH 11	19298	612	CH 11	19322
36	CH 12	19129	614	CH 12	19160
38	CH 13	22950	616	CH 13	22987
40	CH 14	20506	618	CH 14	20501
42	CH 15	15130	620	CH 15	15136
44	REFLECTOR 1 POSITION 2	166	622	REFLECTOR 1 POSITION 19	2748
46	REFLECTOR 2 POSITION 2	16373	624	REFLECTOR 2 POSITION 19	2570
48	REFL 1 POS 2 2ND LOOK	173	626	REFL 1 POS 19 2ND LOOK	2753
50	REFL 2 POS 2 2ND LOOK	16376	628	REFL 2 POS 19 2ND LOOK	2571
52	SCENE DATA BP 2 CH 3	16624	630	SCENE DATA BP 19 CH 3	16593
54	CH 4	16584	632	CH 4	16576
56	CH 5	16957	634	CH 5	16950
58	CH 6	16948	636	CH 6	16948
60	CH 7	16561	638	CH 7	16558
62	CH 8	15207	640	CH 8	15222
64	CH 9	16507	642	CH 9	16508
66	CH 10	16252	644	CH 10	16245
68	CH 11	19300	646	CH 11	19298
70	CH 12	19133	648	CH 12	19126
72	CH 13	22949	650	CH 13	22934
74	CH 14	20476	652	CH 14	20500
76	CH 15	15132	654	CH 15	15130
78	REFLECTOR 1 POSITION 3	323	656	REFLECTOR 1 POSITION 20	2898
80	REFLECTOR 2 POSITION 3	145	658	REFLECTOR 2 POSITION 20	2720
82	REFL 1 POS 3 2ND LOOK	326	660	REFL 1 POS 20 2ND LOOK	2905
84	REFL 2 POS 3 2ND LOOK	148	662	REFL 2 POS 20 2ND LOOK	2722
86	SCENE DATA BP 3 CH 3	16607	664	SCENE DATA BP 20 CH 3	16600
88	CH 4	16585	666	CH 4	16578
90	CH 5	16959	668	CH 5	16949
92	CH 6	16943	670	CH 6	16948

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
94	CH 7	16562	672	CH 7	16559
96	CH 8	15206	674	CH 8	15216
98	CH 9	16509	676	CH 9	16508
100	CH 10	16255	678	CH 10	16255
102	CH 11	19309	680	CH 11	19305
104	CH 12	19131	682	CH 12	19138
106	CH 13	22960	684	CH 13	22953
108	CH 14	20498	686	CH 14	20495
110	CH 15	15133	688	CH 15	15130
112	REFLECTOR 1 POSITION 4	474	690	REFLECTOR 1 POSITION 21	3052
114	REFLECTOR 2 POSITION 4	299	692	REFLECTOR 2 POSITION 21	2870
116	REFL 1 POS 4 2ND LOOK	478	694	REFL 1 POS 21 2ND LOOK	3056
118	REFL 2 POS 4 2ND LOOK	300	696	REFL 2 POS 21 2ND LOOK	2874
120	SCENE DATA BP 4 CH 3	16602	698	SCENE DATA BP 21 CH 3	16599
122	CH 4	16583	700	CH 4	16577
124	CH 5	16956	702	CH 5	16950
126	CH 6	16953	704	CH 6	16946
128	CH 7	16573	706	CH 7	16557
130	CH 8	15216	708	CH 8	15212
132	CH 9	16514	710	CH 9	16510
134	CH 10	16266	712	CH 10	16248
136	CH 11	19301	714	CH 11	19307
138	CH 12	19139	716	CH 12	19136
140	CH 13	22953	718	CH 13	22960
142	CH 14	20474	720	CH 14	20506
144	CH 15	15133	722	CH 15	15129
146	REFLECTOR 1 POSITION 5	627	724	REFLECTOR 1 POSITION 22	3202
148	REFLECTOR 2 POSITION 5	444	726	REFLECTOR 2 POSITION 22	3025
150	REFL 1 POS 5 2ND LOOK	631	728	REFL 1 POS 22 2ND LOOK	3206
152	REFL 2 POS 5 2ND LOOK	449	730	REFL 2 POS 22 2ND LOOK	3027
154	SCENE DATA BP 5 CH 3	16594	732	SCENE DATA BP 22 CH 3	16600
156	CH 4	16581	734	CH 4	16578
158	CH 5	16952	736	CH 5	16954
160	CH 6	16952	738	CH 6	16950
162	CH 7	16584	740	CH 7	16560
164	CH 8	15215	742	CH 8	15212
166	CH 9	16520	744	CH 9	16509
168	CH 10	16260	746	CH 10	16249
170	CH 11	19288	748	CH 11	19301
172	CH 12	19133	750	CH 12	19134
174	CH 13	22972	752	CH 13	22966
176	CH 14	20511	754	CH 14	20502
178	CH 15	15134	756	CH 15	15130
180	REFLECTOR 1 POSITION 6	779	758	REFLECTOR 1 POSITION 23	3350
182	REFLECTOR 2 POSITION 6	597	760	REFLECTOR 2 POSITION 23	3175
184	REFL 1 POS 6 2ND LOOK	781	762	REFL 1 POS 23 2ND LOOK	3357
186	REFL 2 POS 6 2ND LOOK	599	764	REFL 2 POS 23 2ND LOOK	3177
188	SCENE DATA BP 6 CH 3	16602	766	SCENE DATA BP 23 CH 3	16595
190	CH 4	16573	768	CH 4	16574
192	CH 5	16953	770	CH 5	16955

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
194	CH 6	16956	772	CH 6	16948
196	CH 7	16583	774	CH 7	16561
198	CH 8	15212	776	CH 8	15212
200	CH 9	16517	778	CH 9	16506
202	CH 10	16241	780	CH 10	16249
204	CH 11	19307	782	CH 11	19302
206	CH 12	19137	784	CH 12	19135
208	CH 13	22973	786	CH 13	22933
210	CH 14	20519	788	CH 14	20489
212	CH 15	15139	790	CH 15	15130
214	REFLECTOR 1 POSITION 7	928	792	REFLECTOR 1 POSITION 24	3504
216	REFLECTOR 2 POSITION 7	751	794	REFLECTOR 2 POSITION 24	3328
218	REFL 1 POS 7 2ND LOOK	933	796	REFL 1 POS 24 2ND LOOK	3508
220	REFL 2 POS 7 2ND LOOK	749	798	REFL 2 POS 24 2ND LOOK	3329
222	SCENE DATA BP 7 CH 3	16600	800	SCENE DATA BP 24 CH 3	16596
224	CH 4	16574	802	CH 4	16576
226	CH 5	16947	804	CH 5	16950
228	CH 6	16949	806	CH 6	16949
230	CH 7	16571	808	CH 7	16562
232	CH 8	15215	810	CH 8	15215
234	CH 9	16511	812	CH 9	16507
236	CH 10	16250	814	CH 10	16244
238	CH 11	19301	816	CH 11	19298
240	CH 12	19128	818	CH 12	19122
242	CH 13	22964	820	CH 13	22952
244	CH 14	20490	822	CH 14	20473
246	CH 15	15134	824	CH 15	15131
248	REFLECTOR 1 POSITION 8	1080	826	REFLECTOR 1 POSITION 25	3655
250	REFLECTOR 2 POSITION 8	899	828	REFLECTOR 2 POSITION 25	3477
252	REFL 1 POS 8 2ND LOOK	1085	830	REFL 1 POS 25 2ND LOOK	3660
254	REFL 2 POS 8 2ND LOOK	903	832	REFL 2 POS 25 2ND LOOK	3480
256	SCENE DATA BP 8 CH 3	16589	834	SCENE DATA BP 25 CH 3	16591
258	CH 4	16575	836	CH 4	16578
260	CH 5	16954	838	CH 5	16951
262	CH 6	16947	840	CH 6	16946
264	CH 7	16566	842	CH 7	16561
266	CH 8	15219	844	CH 8	15210
268	CH 9	16510	846	CH 9	16507
270	CH 10	16251	848	CH 10	16244
272	CH 11	19297	850	CH 11	19296
274	CH 12	19128	852	CH 12	19119
276	CH 13	22962	854	CH 13	22944
278	CH 14	20469	856	CH 14	20469
280	CH 15	15132	858	CH 15	15128
282	REFLECTOR 1 POSITION 9	1233	860	REFLECTOR 1 POSITION 26	3805
284	REFLECTOR 2 POSITION 9	1052	862	REFLECTOR 2 POSITION 26	3629
286	REFL 1 POS 9 2ND LOOK	1236	864	REFL 1 POS 26 2ND LOOK	3811
288	REFL 2 POS 9 2ND LOOK	1055	866	REFL 2 POS 26 2ND LOOK	3633
290	SCENE DATA BP 9 CH 3	16598	868	SCENE DATA BP 26 CH 3	16596
292	CH 4	16582	870	CH 4	16582

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
294	CH 5	16959	872	CH 5	16947
296	CH 6	16949	874	CH 6	16946
298	CH 7	16563	876	CH 7	16562
300	CH 8	15217	878	CH 8	15220
302	CH 9	16509	880	CH 9	16506
304	CH 10	16251	882	CH 10	16254
306	CH 11	19299	884	CH 11	19289
308	CH 12	19140	886	CH 12	19132
310	CH 13	22964	888	CH 13	22948
312	CH 14	20479	890	CH 14	20491
314	CH 15	15133	892	CH 15	15130
316	REFLECTOR 1 POSITION 10	1385	894	REFLECTOR 1 POSITION 27	3969
318	REFLECTOR 2 POSITION 10	1205	896	REFLECTOR 2 POSITION 27	3783
320	REFL 1 POS 10 2ND LOOK	1389	898	REFL 1 POS 27 2ND LOOK	3971
322	REFL 2 POS 10 2ND LOOK	1206	900	REFL 2 POS 27 2ND LOOK	3786
324	SCENE DATA BP 10 CH 3	16613	902	SCENE DATA BP 27 CH 3	16570
326	CH 4	16580	904	CH 4	16579
328	CH 5	16950	906	CH 5	16953
330	CH 6	16950	908	CH 6	16950
332	CH 7	16560	910	CH 7	16565
334	CH 8	15218	912	CH 8	15224
336	CH 9	16512	914	CH 9	16506
338	CH 10	16255	916	CH 10	16253
340	CH 11	19298	918	CH 11	19302
342	CH 12	19119	920	CH 12	19133
344	CH 13	22966	922	CH 13	22927
346	CH 14	20470	924	CH 14	20487
348	CH 15	15131	926	CH 15	15131
350	REFLECTOR 1 POSITION 11	1535	928	REFLECTOR 1 POSITION 28	4110
352	REFLECTOR 2 POSITION 11	1356	930	REFLECTOR 2 POSITION 28	3938
354	REFL 1 POS 11 2ND LOOK	1539	932	REFL 1 POS 28 2ND LOOK	4114
356	REFL 2 POS 11 2ND LOOK	1357	934	REFL 2 POS 28 2ND LOOK	3936
358	SCENE DATA BP 11 CH 3	16566	936	SCENE DATA BP 28 CH 3	16573
360	CH 4	16580	938	CH 4	16573
362	CH 5	16958	940	CH 5	16957
364	CH 6	16948	942	CH 6	16949
366	CH 7	16565	944	CH 7	16560
368	CH 8	15216	946	CH 8	15247
370	CH 9	16512	948	CH 9	16510
372	CH 10	16250	950	CH 10	16245
374	CH 11	19305	952	CH 11	19301
376	CH 12	19137	954	CH 12	19133
378	CH 13	22970	956	CH 13	22954
380	CH 14	20484	958	CH 14	20494
382	CH 15	15132	960	CH 15	15130
384	REFLECTOR 1 POSITION 12	1687	962	REFLECTOR 1 POSITION 29	4261
386	REFLECTOR 2 POSITION 12	1508	964	REFLECTOR 2 POSITION 29	4086
388	REFL 1 POS 12 2ND LOOK	1691	966	REFL 1 POS 29 2ND LOOK	4267
390	REFL 2 POS 12 2ND LOOK	1510	968	REFL 2 POS 29 2ND LOOK	4088
392	SCENE DATA BP 12 CH 3	16592	970	SCENE DATA BP 29 CH 3	16513

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
394	CH 4	16580	972	CH 4	16583
396	CH 5	16953	974	CH 5	16965
398	CH 6	16946	976	CH 6	16946
400	CH 7	16561	978	CH 7	16561
402	CH 8	15211	980	CH 8	15194
404	CH 9	16511	982	CH 9	16508
406	CH 10	16254	984	CH 10	16254
408	CH 11	19302	986	CH 11	19297
410	CH 12	19132	988	CH 12	19136
412	CH 13	22945	990	CH 13	22947
414	CH 14	20494	992	CH 14	20473
416	CH 15	15131	994	CH 15	15129
418	REFLECTOR 1 POSITION 13	1839	996	REFLECTOR 1 POSITION 30	4419
420	REFLECTOR 2 POSITION 13	1660	998	REFLECTOR 2 POSITION 30	4235
422	REFL 1 POS 13 2ND LOOK	1843	1000	REFL 1 POS 30 2ND LOOK	4422
424	REFL 2 POS 13 2ND LOOK	1661	1002	REFL 2 POS 30 2ND LOOK	4240
426	SCENE DATA BP 13 CH 3	16552	1004	SCENE DATA BP 30 CH 3	16590
428	CH 4	16576	1006	CH 4	16576
430	CH 5	16960	1008	CH 5	16952
432	CH 6	16956	1010	CH 6	16944
434	CH 7	16588	1012	CH 7	16561
436	CH 8	15202	1014	CH 8	15227
438	CH 9	16510	1016	CH 9	16506
440	CH 10	16251	1018	CH 10	16248
442	CH 11	19304	1020	CH 11	19296
444	CH 12	19148	1022	CH 12	19123
446	CH 13	22986	1024	CH 13	22943
448	CH 14	20513	1026	CH 14	20500
450	CH 15	15136	1028	CH 15	15129
452	REFLECTOR 1 POSITION 14	1989	1030	REFLECTOR 1 COLD CAL POS	6017
454	REFLECTOR 2 POSITION 14	1809	1032	REFLECTOR 2 COLD CAL POS	5834
456	REFL 1 POS 14 2ND LOOK	1994	1034	REFL 1 COLD CAL 2ND LOOK	6017
458	REFL 2 POS 14 2ND LOOK	1812	1036	REFL 2 COLD CAL 2ND LOOK	5834
460	SCENE DATA BP 14 CH 3	16570	1038	COLD CAL DATA 1 CH 3	16559
462	CH 4	16581	1040	CH 4	16574
464	CH 5	16957	1042	CH 5	16948
466	CH 6	16953	1044	CH 6	16946
468	CH 7	16582	1046	CH 7	16558
470	CH 8	15233	1048	CH 8	15231
472	CH 9	16514	1050	CH 9	16507
474	CH 10	16249	1052	CH 10	16246
476	CH 11	19300	1054	CH 11	19296
478	CH 12	19135	1056	CH 12	19127
480	CH 13	22956	1058	CH 13	22936
482	CH 14	20497	1060	CH 14	20482
484	CH 15	15134	1062	CH 15	15129
486	REFLECTOR 1 POSITION 15	2143	1064	COLD CAL DATA 2 CH 3	16557
488	REFLECTOR 2 POSITION 15	1964	1066	CH 4	16576
490	REFL 1 POS 15 2ND LOOK	2146	1068	CH 5	16953
492	REFL 2 POS 15 2ND LOOK	1964	1070	CH 6	16942

ELEMENT	DESCRIPTION	VALUE	ELEMENT	DESCRIPTION	VALUE
494	SCENE DATA BP 15 CH 3	16615	1072	CH 7	16559
496	CH 4	16587	1074	CH 8	15227
498	CH 5	16957	1076	CH 9	16509
500	CH 6	16952	1078	CH 10	16246
502	CH 7	16562	1080	CH 11	19291
504	CH 8	15224	1082	CH 12	19132
506	CH 9	16514	1084	CH 13	22952
508	CH 10	16263	1086	CH 14	20484
510	CH 11	19285	1088	CH 15	15130
512	CH 12	19143	1182	REFLECTOR 1 WARM CAL POS	10415
514	CH 13	22976	1184	REFLECTOR 2 WARM CAL POS	10234
516	CH 14	20492	1186	REFL 1 WARM CAL 2ND LOOK	10415
518	CH 15	15132	1188	REFL 2 WARM CAL 2ND LOOK	10233
520	REFLECTOR 1 POSITION 16	2295	1190	WARM CAL DATA 1 CH 3	16588
522	REFLECTOR 2 POSITION 16	2113	1192	CH 4	16570
524	REFL 1 POS 16 2ND LOOK	2298	1194	CH 5	16944
526	REFL 2 POS 16 2ND LOOK	2115	1196	CH 6	16937
528	SCENE DATA BP 16 CH 3	16638	1198	CH 7	16554
530	CH 4	16591	1200	CH 8	15211
532	CH 5	16957	1202	CH 9	16498
534	CH 6	16953	1204	CH 10	16242
536	CH 7	16569	1206	CH 11	19280
538	CH 8	15233	1208	CH 12	19111
540	CH 9	16515	1210	CH 13	22947
542	CH 10	16256	1212	CH 14	20488
544	CH 11	19284	1214	CH 15	15125
546	CH 12	19138	1216	WARM CAL DATA 2 CH 3	16589
548	CH 13	22966	1218	CH 4	16572
550	CH 14	20507	1220	CH 5	16948
552	CH 15	15136	1222	CH 6	16936
554	REFLECTOR 1 POSITION 17	2445	1224	CH 7	16553
556	REFLECTOR 2 POSITION 17	2261	1226	CH 8	15212
558	REFL 1 POS 17 2ND LOOK	2450	1228	CH 9	16498
560	REFL 2 POS 17 2ND LOOK	2266	1230	CH 10	16240
562	SCENE DATA BP 17 CH 3	16578	1232	CH 11	19292
564	CH 4	16584	1234	CH 12	19110
566	CH 5	16957	1236	CH 13	22926
568	CH 6	16955	1238	CH 14	20465
570	CH 7	16579	1240	CH 15	15124

FULL SCAN MODE

ELEMENT	DESCRIPTION	VALUE	TEMPERATURE DEG C
1090	SCAN MOTOR A1-1	17080	21.85
1092	SCAN MOTOR A1-2	17979	22.37
1094	FEEDHORN A1-1	17695	22.44
1096	FEEDHORN A1-2	18039	23.14
1098	RF MUX A1-1	18424	23.38
1100	RF MUX A1-2	18660	23.88
1102	LOCAL OSCILLATOR CHANNEL 3	19741	25.84
1104	LOCAL OSCILLATOR CHANNEL 4	19741	25.54
1106	LOCAL OSCILLATOR CHANNEL 5	19449	25.50
1108	LOCAL OSCILLATOR CHANNEL 6	18725	24.30
1110	LOCAL OSCILLATOR CHANNEL 7	18902	24.44
1112	LOCAL OSCILLATOR CHANNEL 8	19597	25.48
1114	LOCAL OSCILLATOR CHANNEL 15	19689	25.41
1116	PLL LO #2 CHANNELS 9 THROUGH 14	11093	22.86
1118	PLL LO #1 CHANNELS 9 THROUGH 14	20579	27.50
1120	SPARE (NOT USED)	32767	51.27
1122	MIXER/IF AMPLIFIER CHANNEL 3	19294	24.19
1124	MIXER/IF AMPLIFIER CHANNEL 4	19298	24.39
1126	MIXER/IF AMPLIFIER CHANNEL 5	19037	24.28
1128	MIXER/IF AMPLIFIER CHANNEL 6	18645	23.89
1130	MIXER/IF AMPLIFIER CHANNEL 7	18557	23.96
1132	MIXER/IF AMPLIFIER CHANNEL 8	19114	24.37
1134	MIXER/IF AMPLIFIER CH 9 THRU 14	18576	23.25
1136	MIXER/IF AMPLIFIER CHANNEL 15	19246	25.49
1138	IF AMPLIFIER CHANNEL 11 THRU 14	19123	24.84
1140	IF AMPLIFIER CHANNEL 9	19120	24.88
1142	IF AMPLIFIER CHANNEL 10	19268	24.87
1144	IF AMPLIFIER CHANNEL 11	18342	23.42
1146	DC/DC CONVERTER	20337	27.11
1148	IF AMPLIFIER CHANNEL 13	18381	23.46
1150	IF AMPLIFIER CHANNEL 14	18490	23.46
1152	IF AMPLIFIER CHANNEL 12	18273	23.37
1154	RF SHELF A1-1	18296	24.25
1156	RF SHELF A1-2	18665	24.12
1158	DETECTOR/PREAMPLIFIER ASSEMBLY	17653	22.42
1160	A1-1 WARM LOAD 1	22623	21.62
1162	A1-1 WARM LOAD 2	22398	21.61
1164	A1-1 WARM LOAD 3	22608	21.65
1166	A1-1 WARM LOAD 4	22559	21.63
1168	A1-1 WARM LOAD CENTER	22632	21.75
1170	A1-2 WARM LOAD 1	22761	22.31
1172	A1-2 WARM LOAD 2	22901	22.21
1174	A1-2 WARM LOAD 3	23059	22.33
1176	A1-2 WARM LOAD 4	22829	22.34
1178	A1-2 WARM LOAD CENTER	22751	22.29
1180	TEMP SENSOR REFERENCE VOLTAGE	25319	

FULL SCAN MODE

DESCRIPTION	STATUS	STATUS	STATUS
SCANNER A1-1 POWER	ON	ON	ON
SCANNER A1-2 POWER	ON	ON	ON
PLL POWER	PLLO # 1	PLLO # 1	PLLO # 1
ANTENNA IN WARM CAL POSITION MODE	NO	NO	NO
ANTENNA IN COLD CAL POSITION MODE	NO	NO	NO
ANTENNA IN NADIR POSITION MODE	NO	NO	NO
ANTENNA IN FULL SCAN MODE	YES	YES	YES
SURVIVAL HEATER POWER	OFF	OFF	OFF
MODULE POWER	CONNECT	CONNECT	CONNECT
COLD CAL POSITION MSB	ZERO	ZERO	ZERO
COLD CAL POSITION LSB	ZERO	ZERO	ZERO

ANALOG DATA

DESCRIPTION	VALUE	DEG C	VALUE	DEG C	VALUE	DEG C
A1-1 SCANNER MOTOR TEMPERATURE	214	18.0	214	18.0	214	18.0
A1-2 SCANNER MOTOR TEMPERATURE	214	18.0	214	18.0	214	18.0
A1-1 RF SHELF TEMPERATURE	214	18.0	214	18.0	214	18.0
A1-2 RF SHELF TEMPERATURE	215	19.4	215	19.4	215	19.4
A1-1 WARM LOAD TEMPERATURE	213	16.6	213	16.6	213	16.6
A1-2 WARM LOAD TEMPERATURE	214	18.0	214	18.0	214	18.0

DESCRIPTION	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS	VALUE	AMPS/ VOLTS
A1-1 ANTENNA DRIVE MOTOR CURRENT (AVRG)	86	40.08	87	40.54	86	40.08
A1-2 ANTENNA DRIVE MOTOR CURRENT (AVRG)	83	38.68	83	38.68	83	38.68
SIGNAL PROCESSING +15 VDC	170	14.67	170	14.67	170	14.67
ANTENNA DRIVE +15 VDC	169	14.58	169	14.58	169	14.58
SIGNAL PROCESSING -15 VDC	148	-15.15	148	-15.15	148	-15.15
ANTENNA DRIVE -15 VDC	146	-15.25	146	-15.25	146	-15.25
RECEIVER AMPLIFIER +8 VDC	156	7.80	156	7.80	156	7.80
SIGNAL PROCESSOR +5 VDC	145	4.83	145	4.83	145	4.83
ANTENNA DRIVE +5 VDC	145	4.83	144	4.80	145	4.83
RECEIVER MIXER/IF +10 VDC	169	9.76	168	9.71	168	9.71
PHASE LOCK LOOP (CHANNEL 9/14) +15 VDC	169	14.58	169	14.58	169	14.58
PHASE LOCK LOOP (CHANNEL 9/14) -15 VDC	143	-15.40	143	-15.40	143	-15.40
L.O. VOLTAGE (CHANNEL 8) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 7) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 6) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 3) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 4) VDC	171	9.78	171	9.78	171	9.78
L.O. VOLTAGE (CHANNEL 5) VDC	171	9.78	171	9.78	171	9.78
PLLO # 2 LOCK DETECT	2	0.04	2	0.04	2	0.04
PLLO # 1 LOCK DETECT	219	4.38	219	4.38	219	4.38
L.O. VOLTAGE (CHANNEL 15) VDC	170	14.67	170	14.67	170	14.67

FULL SCAN MODE

PRT TEMPERATURES	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
VARIABLE TARGET	615	42.00	601	14.00
	616	43.00	602	15.00
	617	44.00	603	16.00
	618	45.00	604	17.00
	619	46.00	605	18.00
	620	47.00	606	19.00
	621	48.00	607	20.00
FIXED TARGET	622	49.00	608	21.00
	623	50.00	609	22.00
	624	51.00	610	23.00
	625	52.00	611	24.00
	626	53.00	612	25.00
	627	67.00	613	69.00
	628	68.00	614	70.00
BASEPLATE	629	71.00	630	72.00
	631	26.00	632	27.00

THERMOCOUPLE TEMPERATURES	A1-1 NO.	A1-1 DEG K	A1-2 NO.	A1-2 DEG K
FIXED TARGET SHROUD	558	5.00	537	34.00
	559	6.00	538	35.00
VARIABLE TARGET SHROUD	550	7.00	524	36.00
	551	8.00	525	37.00
FIXED TARGET N2	506	57.00	502	30.00
	507	58.00	503	31.00
VARIABLE TARGET N2	516	59.00	511	32.00
	517	60.00	512	33.00
HEATER N2	514	1.00	509	38.00
	515	2.00	510	39.00
FIXED TARGET FLOW METER	508	63.00	504	61.00
VARIABLE TARGET FLOW METER	518	64.00	513	62.00
BASEPLATE HEATER N2	519	3.00	520	4.00
BASEPLATE N2	521	9.00	522	10.00
BASEPLATE FLOW METER	523	65.00		
ADJUNCT RADIATORS	575	73.00	577	74.00
	579	75.00	581	76.00

AMSU A1-33 A1.EXE FULL SCAN MODE P1 12-MAY-00 10:38:15 SCAN NUMBER 62

[5] DIGITAL A DATA ELEMENT 0000

[6] DIGITAL B DATA ELEMENT 00

[7] ANALOG DATA ELEMENT 00

RADIOMETRIC DATA
CHANNEL 7

BP	DATA	BP	DATA	BP	DATA	BP	DATA
1	16564	9	16561	17	16578	25	16563
2	16569	10	16562	18	16587	26	16563
3	16564	11	16566	19	16564	27	16566
4	16577	12	16569	20	16561	28	16565
5	16590	13	16590	21	16560	29	16565
6	16585	14	16586	22	16566	30	16565
7	16566	15	16561	23	16563	CC	16561
8	16565	16	16569	24	16561	WC	16555

[21] UP [22] DOWN

POWER [4] ON
SCREEN ONLY [2] PRINT [3] FULL [1] RETURN

SELECT TOUCHSCREEN BUTTON 2

Channel 7 Rework

TEST DATA SHEET 50 (Sheet 1 of 2)
Radiometer "Relative" NEΔT Verification* (Paragraph 3.2.4.4.2.2)

Channels 3, 4, 5, 6, 7, 8, and 15. PLLO No. 1 (Channels 9 through 14)

Channel Number>	3	4	5	6
NEΔT (Average of 5 data)	0.254	0.171	0.153	0.137
Pass/Fail	PASS	PASS	PASS	PASS
NEΔT (Specified) K **	0.40	0.25	0.25	0.25
Channel Number>	7	8	9	10
NEΔT (Average of 5 data)	0.154	0.208	0.173	0.205
Pass/Fail	PASS	PASS	PASS	PASS
NEΔT (Specified) K **	0.25	0.25	0.25	0.40
Channel Number>	11	12	13	14
NEΔT (Average of 5 data)	0.238	0.324	0.454	0.706
Pass/Fail	PASS	PASS	PASS	PASS
NEΔT (Specified) K **	0.40	0.60	0.80	1.20
Channel Number>	15			
NEΔT (Average of 5 data)	0.147			
Pass/Fail	PASS			
NEΔT (Specified) K **	0.50			

* Baseline data for acceptance tests. Use first CPT or first LPT data along with specification value for pass/fail criteria

** For reference only

Circle Test: CPT LPT NEΔT

Oper. 00800 Step C

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 822739 S/N: 109

Ken Shane 5/12/00
Test Systems Engineer Date

Joseph Sanford 5/12/00
Customer Representative (Flight Hardware Only) Date

QA 275

Anita Navarro 5/12/00
Quality Control Date

Channel 7 Rework

TEST DATA SHEET 50 (Sheet 2 of 2)
Radiometer "Relative" NEΔT Verification* (Paragraph 3.2.4.4.2.2)

PLLO No. 2 (Channels 9 through 14)

Channel Number>	9	10	11	12
NEΔT (Average of 5 data)	0.197	0.238	0.251	0.349
Pass/Fail	PASS	PASS	PASS	PASS
NEΔT (Specified) K **	0.25	0.40	0.40	0.60
Channel Number>	13	14		
NEΔT (Average of 5 data)	0.458	0.775		
Pass/Fail	PASS	PASS		
NEΔT (Specified) K **	0.80	1.20		

* Baseline data for acceptance tests. Use first CPT or first LPT data along with specification value for pass/fail criteria

** For reference only

Circle Test: CPT LPT NEΔT

Oper. 00800 Step C

METSAT/AMSU-A1 System P/N IS-1331720 Shop Order: 822739 S/N: 109

Ken Shaw 5/12/00
Test Systems Engineer Date

Joseph Sanford 5/12/00
Customer Representative (Flight Hardware Only) Date

7A 275 Anita Navarro 5/12/00
Quality Control Date

A1.EXE

A1 FUNCTIONAL TEST RESULTS
12-MAY-00 13:37:17

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.44	16521.0	16514.0	1.000	3.032
4	296.44	16428.0	16417.0	1.000	1.905
5	296.44	16861.0	16849.0	1.000	2.502
6	294.77	16824.0	13663.0	0.068	0.114
7	294.77	16393.0	13685.0	0.079	0.171
8	296.44	15115.0	15105.0	1.000	2.581
9	294.77	16493.0	13598.0	0.074	0.154 -
10	294.77	16199.0	13366.0	0.076	0.249 -
11	294.77	19080.0	15510.0	0.060	0.284 -
12	294.77	18940.0	15411.0	0.061	0.356 -
13	294.77	22689.0	17642.0	0.043	0.511 -
14	294.77	20205.0	16271.0	0.055	0.795 -
15	294.77	15013.0	13459.0	0.138	0.157

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

PLLO #2

Test Data in support of TDS50
S/O 822739 Oper. 00800 Step C
Metsat A1 S/N109
Channel 7 Rework

A1 FUNCTIONAL TEST RESULTS
A1.EXE 12-MAY-00 13:38:37

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.44	16519.0	16506.0	1.000	3.182
4	296.44	16424.0	16410.0	1.000	2.025
5	296.44	16857.0	16844.0	1.000	2.163
6	294.75	16820.0	13660.0	0.068	0.145
7	294.75	16390.0	13682.0	0.079	0.161
8	296.44	15112.0	15102.0	1.000	2.221
9	294.75	16479.0	13587.0	0.074	0.238 -
10	294.75	16187.0	13358.0	0.076	0.225 -
11	294.75	19064.0	15498.0	0.060	0.232 -
12	294.75	18923.0	15400.0	0.061	0.339 -
13	294.75	22667.0	17630.0	0.043	0.463 -
14	294.75	20184.0	16259.0	0.055	0.707 -
15	294.75	15011.0	13458.0	0.138	0.152

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]
SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS

A1.EXE 12-MAY-00 13:40:05

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.45	16515.0	16502.0	1.000	3.754
4	296.45	16418.0	16404.0	1.000	2.098
5	296.45	16853.0	16838.0	1.000	2.456
6	294.73	16816.0	13656.0	0.068	0.137
7	294.73	16387.0	13680.0	0.079	0.167
8	296.45	15108.0	15099.0	1.000	2.303
9	294.73	16469.0	13581.0	0.074	0.188 -
10	294.73	16177.0	13351.0	0.076	0.255 -
11	294.73	19052.0	15491.0	0.060	0.236 -
12	294.73	18911.0	15391.0	0.061	0.346 -
13	294.73	22647.0	17614.0	0.043	0.396 -
14	294.73	20164.0	16243.0	0.055	0.839 -
15	294.73	15008.0	13456.0	0.138	0.127

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1.EXE

A1 FUNCTIONAL TEST RESULTS

12-MAY-00 13:41:17

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.46	16514.0	16502.0	1.000	2.870
4	296.46	16416.0	16402.0	1.000	1.890
5	296.46	16851.0	16839.0	1.000	2.062
6	294.71	16814.0	13666.0	0.068	0.126
7	294.71	16385.0	13687.0	0.080	0.164
8	296.46	15108.0	15097.0	1.000	2.140
9	294.71	16460.0	13579.0	0.075	0.202 -
10	294.71	16169.0	13352.0	0.076	0.229 -
11	294.71	19040.0	15491.0	0.060	0.264 -
12	294.71	18898.0	15391.0	0.061	0.365 -
13	294.71	22634.0	17617.0	0.043	0.456 -
14	294.71	20155.0	16248.0	0.055	0.785 -
15	294.71	15008.0	13459.0	0.139	0.139

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS
A1.EXE 12-MAY-00 13:42:29

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.46	16512.0	16501.0	1.000	3.013
4	296.46	16412.0	16400.0	1.000	2.050
5	296.46	16852.0	16838.0	1.000	2.215
6	294.69	16811.0	13662.0	0.068	0.135
7	294.69	16381.0	13684.0	0.080	0.145
8	296.46	15103.0	15096.0	1.000	2.154
9	294.69	16450.0	13571.0	0.075	0.202 –
10	294.69	16160.0	13344.0	0.076	0.232 –
11	294.69	19027.0	15480.0	0.061	0.239 –
12	294.69	18887.0	15382.0	0.061	0.341 –
13	294.69	22618.0	17604.0	0.043	0.463 –
14	294.69	20142.0	16237.0	0.055	0.748 –
15	294.69	15004.0	13457.0	0.139	0.175

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]
SELECT TOUCHSCREEN BUTTON 2

A1.EXE A1 FUNCTIONAL TEST RESULTS 12-MAY-00 13:26:37

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.40	16538.0	16526.0	1.000	3.056
4	296.40	16467.0	16451.0	1.000	2.259
5	296.40	16882.0	16867.0	1.000	2.138
6	294.94	16853.0	13675.0	0.068	0.149
7	294.94	16413.0	13691.0	0.079	0.163
8	296.40	15141.0	15129.0	1.000	2.023
9	294.94	16421.0	13538.0	0.075	0.173
10	294.94	16148.0	13323.0	0.076	0.183
11	294.94	19061.0	15493.0	0.060	0.237
12	294.94	18912.0	15388.0	0.061	0.283
13	294.94	22656.0	17613.0	0.043	0.428
14	294.94	20192.0	16264.0	0.055	0.730
15	294.94	15037.0	13473.0	0.137	0.134

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

PLLO # 1

Test Data in support of TDS 50
S/O 822739 Oper. 00800 Step C
Metsat A1 S/N 109
Channel 7 Rework

A1.EXE A1 FUNCTIONAL TEST RESULTS 12-MAY-00 13:28:37

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.41	16535.0	16524.0	1.000	3.130
4	296.41	16460.0	16444.0	1.000	1.695
5	296.41	16880.0	16866.0	1.000	2.295
6	294.89	16846.0	13680.0	0.068	0.129-
7	294.89	16413.0	13700.0	0.079	0.148-
8	296.41	15137.0	15124.0	1.000	2.189
9	294.89	16421.0	13546.0	0.075	0.166-
10	294.89	16144.0	13329.0	0.076	0.209-
11	294.89	19059.0	15501.0	0.060	0.227-
12	294.89	18909.0	15396.0	0.061	0.352-
13	294.89	22650.0	17622.0	0.043	0.458-
14	294.89	20190.0	16270.0	0.055	0.703-
15	294.89	15035.0	13476.0	0.138	0.183-

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS

A1.EXE 12-MAY-00 13:29:49

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.41	16533.0	16522.0	1.000	2.695
4	296.41	16455.0	16440.0	1.000	2.328
5	296.41	16880.0	16864.0	1.000	2.238
6	294.87	16843.0	13697.0	0.068	0.127
7	294.87	16410.0	13714.0	0.080	0.148
8	296.41	15135.0	15124.0	1.000	2.215
9	294.87	16419.0	13560.0	0.075	0.188
10	294.87	16142.0	13341.0	0.077	0.192
11	294.87	19054.0	15516.0	0.061	0.254
12	294.87	18905.0	15412.0	0.062	0.318
13	294.87	22637.0	17641.0	0.043	0.465
14	294.87	20178.0	16285.0	0.055	0.717
15	294.87	15031.0	13484.0	0.139	0.127

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS
A1.EXE 12-MAY-00 13:31:49

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.42	16527.0	16519.0	1.000	2.902
4	296.42	16447.0	16436.0	1.000	2.086
5	296.42	16874.0	16862.0	1.000	2.213
6	294.84	16837.0	13693.0	0.068	0.125-
7	294.84	16405.0	13712.0	0.080	0.158-
8	296.42	15129.0	15120.0	1.000	2.404
9	294.84	16416.0	13559.0	0.075	0.163-
10	294.84	16137.0	13338.0	0.077	0.227-
11	294.84	19042.0	15507.0	0.061	0.239-
12	294.84	18895.0	15405.0	0.062	0.331-
13	294.84	22624.0	17630.0	0.043	0.462-
14	294.84	20168.0	16272.0	0.055	0.692-
15	294.84	15025.0	13481.0	0.139	0.140-

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]
SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS

A1.EXE 12-MAY-00 13:33:33

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.42	16524.0	16512.0	1.000	3.145
4	296.42	16441.0	16426.0	1.000	1.985
5	296.42	16871.0	16856.0	1.000	2.048
6	294.82	16832.0	13676.0	0.068	0.155
7	294.82	16401.0	13697.0	0.079	0.155
8	296.42	15125.0	15113.0	1.000	2.500
9	294.82	16413.0	13545.0	0.075	0.174
10	294.82	16133.0	13325.0	0.077	0.212
11	294.82	19031.0	15484.0	0.061	0.232
12	294.82	18887.0	15383.0	0.061	0.334
13	294.82	22613.0	17607.0	0.043	0.455
14	294.82	20152.0	16247.0	0.055	0.688
15	294.82	15022.0	13468.0	0.138	0.150

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS
A1.EXE 12-MAY-00 13:46:53

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.48	16506.0	13833.0	0.081	0.249
4	296.48	16402.0	13620.0	0.078	0.156
5	296.48	16842.0	13854.0	0.072	0.134
6	294.64	16806.0	16831.0	1.000	1.720
7	294.64	16361.0	16383.0	1.000	1.528
8	296.48	15091.0	12908.0	0.099	0.217
9	294.64	16411.0	16433.0	1.000	2.753
10	294.64	16132.0	16154.0	1.000	2.735
11	294.64	18990.0	19017.0	1.000	3.322
12	294.64	18845.0	18874.0	1.000	5.340
13	294.64	22555.0	22595.0	1.000	10.522
14	294.64	20082.0	20112.0	1.000	13.343
15	294.64	14988.0	15002.0	1.000	0.907

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]
SELECT TOUCHSCREEN BUTTON 2

PLLO #1

Test Data in support of TDS50
S/O 822739 Oper. 00800 Step C
Metsat A1 S/N 109
Channel 7 Rework

A1 FUNCTIONAL TEST RESULTS
A1.EXE 12-MAY-00 13:48:37

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.47	16506.0	13829.0	0.081	0.252
4	296.47	16400.0	13615.0	0.078	0.170
5	296.47	16840.0	13850.0	0.072	0.156
6	294.63	16802.0	16850.0	1.000	1.962
7	294.63	16357.0	16404.0	1.000	1.799
8	296.47	15088.0	12900.0	0.099	0.198
9	294.63	16399.0	16442.0	1.000	2.679
10	294.63	16124.0	16166.0	1.000	2.617
11	294.63	18978.0	19031.0	1.000	3.781
12	294.63	18834.0	18889.0	1.000	4.637
13	294.63	22536.0	22615.0	1.000	10.094
14	294.63	20069.0	20129.0	1.000	13.167
15	294.63	14985.0	15013.0	1.000	0.850

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]
SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS
A1.EXE 12-MAY-00 13:49:49

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.46	16503.0	13827.0	0.081	0.229
4	296.46	16398.0	13614.0	0.078	0.202
5	296.46	16839.0	13848.0	0.072	0.167
6	294.63	16801.0	16825.0	1.000	1.833
7	294.63	16357.0	16379.0	1.000	2.072
8	296.46	15086.0	12897.0	0.099	0.208
9	294.63	16394.0	16415.0	1.000	2.227
10	294.63	16119.0	16141.0	1.000	2.628
11	294.63	18971.0	18997.0	1.000	4.307
12	294.63	18828.0	18855.0	1.000	5.185
13	294.63	22530.0	22568.0	1.000	10.407
14	294.63	20057.0	20093.0	1.000	15.060
15	294.63	14983.0	14997.0	1.000	0.953

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]
SELECT TOUCHSCREEN BUTTON 2

A1.EXE A1 FUNCTIONAL TEST RESULTS 12-MAY-00 13:50:53

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.44	16500.0	13826.0	0.081	0.271
4	296.44	16396.0	13613.0	0.078	0.154
5	296.44	16838.0	13848.0	0.072	0.153
6	294.63	16798.0	16823.0	1.000	1.964
7	294.63	16356.0	16378.0	1.000	1.806
8	296.44	15086.0	12897.0	0.099	0.217
9	294.63	16390.0	16411.0	1.000	2.042
10	294.63	16115.0	16137.0	1.000	2.771
11	294.63	18964.0	18992.0	1.000	3.613
12	294.63	18822.0	18850.0	1.000	5.340
13	294.63	22519.0	22555.0	1.000	10.670
14	294.63	20051.0	20080.0	1.000	11.733
15	294.63	14982.0	14996.0	1.000	0.921

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

A1 FUNCTIONAL TEST RESULTS

A1.EXE 12-MAY-00 13:53:41

CH	WARM TEMP	WARM COUNTS	COLD COUNTS	GAIN	DELTA T
3	296.40	16498.0	13835.0	0.081	0.270
4	296.40	16392.0	13616.0	0.078	0.172
5	296.40	16836.0	13855.0	0.073	0.153
6	294.64	16792.0	16817.0	1.000	1.698
7	294.64	16354.0	16377.0	1.000	1.872
8	296.40	15081.0	12895.0	0.099	0.200
9	294.64	16380.0	16404.0	1.000	2.334
10	294.64	16107.0	16131.0	1.000	2.916
11	294.64	18952.0	18982.0	1.000	3.760
12	294.64	18810.0	18839.0	1.000	5.419
13	294.64	22504.0	22548.0	1.000	10.307
14	294.64	20037.0	20070.0	1.000	13.789
15	294.64	14981.0	14997.0	1.000	1.199

[2] PRINT SCREEN [3] PRINT RAW DATA [4] PRINT HISTOGRAM

[5] PRINT DISTRIBUTION GRAPH RETURN [1]

SELECT TOUCHSCREEN BUTTON 2

SHOP ORDER NUMBER	SPLIT REFERENCE	COMPLETION DATE	PART DESCRIPTION	PART NUMBER	DWG REV	PLN REV
822739			A1-1 RECEIVER ASSEMBLY	1356429-3	*	01

	WORK CENTER	OPERATION DESCRIPTION	STAMP PROD	STAMP INSP	SETUP / RUN TIME	IR's/EQCR's/TAR's/TRR's COMMENTS
*0000000 *	PC 7GPAS	THE PURPOSE OF THIS S/O IS TO RE-INSTALL A NEW CHANNEL 7 RF CHAIN-DRO, MIXER/AMP, WAVEGUIDE/ATTENUATOR, AND ISOLATOR. REFERENCE TAR 005199. THIS FAILURE OCCURRED IN THERMAL VACUUM. QA 229 5/10/00 RECEIVE FROM ~~S/O~~ TAR 005199 OPER 8150.				
		ISSUE SHOP ORDER AND THE FOLLOWING MATERIAL: 1356429-3 RECEIVER ASSY S/N F06 A/T L00056640 1336610-7 DRO ASSY S/N 85023 A/T A526213 1331562-17 MIXER/AMP S/N 7A67 A/T L00046791 1331509-5 WAVEGUIDE/ATT S/N 103 A/T A503648 1356680-5 ISOLATOR S/N 7 A/T L00033821		I.P. 15 5-09-00		
		DE-KIT THE FOLLOWING MATERIAL: 1336610-7 DRO ASSY S/N 85017 A/T A526403 1331562-17 MIXER/AMP S/N 7A57 A/T L00046857 1331509-5 WAVEGUIDE/ATT S/N 102 A/T A503648 1356680-5 ISOLATOR S/N 008 A/T L00036281		I.P. 16 5-10-00		
		REMAINDER OF HARDWARE REQUIRED WILL BE ISSUED PER MAI'S 0040 AND 0050.				

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Report Documentation Page

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16. ABSTRACT (*Maximum 200 words*)

This is the Performance Verification Report, METSAT (S/N 109) AMSU-A1 Receiver Assemblies, P/N 1356429-1 A/N F06 and P/N 1356409-1 S/N F06, for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

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12b. DISTRIBUTION CODE
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13. ABSTRACT (*Maximum 200 words*)

This is the Performance Verification Report, METSAT (S/N 109) AMSU A1 Receiver Assemblies, P/N 1356429-1 S/N F06 and P/N 1356409-1 S/N F06, for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

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Microwave System

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National Aeronautics and Space Administration

Report Documentation Page

1. Report No. ---	2. Government Accession No. ---	3. Recipient's Catalog No. ---
4. Title and Subtitle Integrated Advanced Microwave Sounding Unit-A (AMSU-A), Performance Verification Report		5. Report Date June 1999 6. Performing Organization Code ---
7. Author(s) R. Haigh		8. Performing Organization Report No. 11491 10. Work Unit No. ---
9. Performing Organization Name and Address Aerojet 1100 W. Hollyvale Azusa, CA 91702		11. Contract or Grant No. NAS 5-32314
12. Sponsoring Agency Name and Address NASA Goddard Space Flight Center Greenbelt, Maryland 20771		13. Type of Report and Period Covered Final 14. Sponsoring Agency Code ---

15. Supplementary Notes

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16. ABSTRACT (*Maximum 200 words*)

This is the Performance Verification Report, METSAT (S/N 109) AMSU-A1 Receiver Assemblies, P/N 1356429-1 S/N F06 and P/N 1356409 S/N F06, for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

17. Key Words (Suggested by Author(s)) EOS Microwave System	18. Distribution Statement Unclassified --- Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of pages	22. Price
Unclassified	Unclassified		---

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Block 3. Recipient's Catalog No.. Reserved for use by each report recipient.

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Block 5. Report Date. Approximate month and year the report will be published.

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Block 9. Performing Organization Name and Address. Provide affiliation (NASA program office, NASA installation, or contractor name) of authors.

Block 10. Work Unit No. Provide Research and Technology Objectives and Plants (RTOP) number.

Block 11. Contract or Grant No. Provide when applicable.

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REPORT DOCUMENTATION PAGE

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2. REPORT DATE

3. REPORT TYPE AND DATES COVERED

4. TITLE AND SUBTITLE

Integrated Advanced Microwave Sounding Unit-A (AMSU-A), Performance Verification Report

5. FUNDING NUMBERS

NAS 5-32314

6. AUTHOR(S)

R. Haigh

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Aerojet
1100 W. Hollyvale
Azusa, CA 91702

8. PERFORMING ORGANIZATION REPORT NUMBER

11491
July 1999

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

NASA
Goddard Space Flight Center
Greenbelt, Maryland 20771

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

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11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE

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13. ABSTRACT (*Maximum 200 words*)

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14. SUBJECT TERMS

EOS
Microwave System

15. NUMBER OF PAGES

16. PRICE CODE

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17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
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G	-	Grant	TA	-	Task
PE	-	Program Element	WU	-	Work Unit Accession No.

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TITLE	DOCUMENT NO.
Performance Verification Report METSAT (S/N 109) AMSU-A1 Receiver Assemblies, P/N 1356429-1 S/N F06 and P/N 1356409-1 S/N F06	Report 11491 June 1999

INPUT FROM:	CDRL:	SPECIFICATION ENGINEER:	DATE
R. Haigh	208	N/A	

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Product Team Leader (A. Nieto) [signature]	8410	7/27/00
Systems Engineer (R. Platt) P. R. Patel	8410	7/21/00
Design Assurance (E. Lorenz) E. Lorenz	8410	7/27/00
Quality Assurance (R. Taylor) R M Taylor	7831	7-27-00
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